



# Source details

## Systematic Reviews in Pharmacy

Scopus coverage years: from 2010 to 2021

(coverage discontinued in Scopus)

Publisher: EManuscript Technologies

ISSN: 0975-8453 E-ISSN: 0976-2779

Subject area: Pharmacology, Toxicology and Pharmaceutics: Pharmaceutical Science

Source type: Journal

CiteScore 2019

3.9



SJR 2019

0.424



SNIP 2021

0.562



[View all documents >](#)

[Set document alert](#)

[Save to source list](#)

[CiteScore](#) [CiteScore rank & trend](#) [Scopus content coverage](#)

### i Improved CiteScore methodology



CiteScore 2019 counts the citations received in 2016-2019 to articles, reviews, conference papers, book chapters and data papers published in 2016-2019, and divides this by the number of publications published in 2016-2019. [Learn more >](#)

CiteScore 2019 ▼

$$3.9 = \frac{463 \text{ Citations 2016 - 2019}}{119 \text{ Documents 2016 - 2019}}$$

Calculated on 06 May, 2020

## CiteScore rank 2019 ⓘ

Category	Rank	Percentile
Pharmacology, Toxicology and Pharmaceutics	#53/169	68th
Pharmaceutical Science		

[View CiteScore methodology >](#) [CiteScore FAQ >](#) [Add CiteScore to your site](#)

## About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

## Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

## Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

---

## ELSEVIER

[Terms and conditions](#) ↗ [Privacy policy](#) ↗

Copyright © Elsevier B.V. ↗. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies ↗.





## Nursing Research Paper

Join Leading Researchers in the Field and Publish With I  
Submit Your Manuscript.

Hindawi

# Systematic Reviews in Pharmacy

Discontinued in Scopus as of 2020

### COUNTRY

India



Universities and research  
institutions in India

### SUBJECT AREA AND CATEGORY

Pharmacology,  
Toxicology and  
Pharmaceutics  
Pharmaceutical  
Science

### PUBLISHER

EManuscript  
Technologies

### H-INDEX

28

### PUBLICATION TYPE

Journals

### ISSN

09758453,  
09762779

### COVERAGE

2010-2021

### INFORMATION

[Homepage](#)

[How to publish in  
this journal](#)

[editor@sysrevpharm  
.org](mailto:editor@sysrevpharm.org)





sc  
The  
tim  
agr  
sys  
pro

to Pharmacy subjects including some of the allied subjects. Articles with given more preference. This journal also publishes manuscripts related to all aspects of crop and animal physiology, modelling of crop and animal husbandry, animal welfare and behaviour, soil science, plant and animal production solutions, decision support systems, land use, environmental impacts of agriculture and forestry, impacts of climate change, rural biodiversity, experimental design and statistical analysis, and the application of new analytical and study methods (including genetic diversity and molecular biology approaches).


 Join the conversation about this journal

## Complexity Research Papers

Join Leading Researchers in the Field of Complexity. Publish Your Next Research With Us

Hindawi

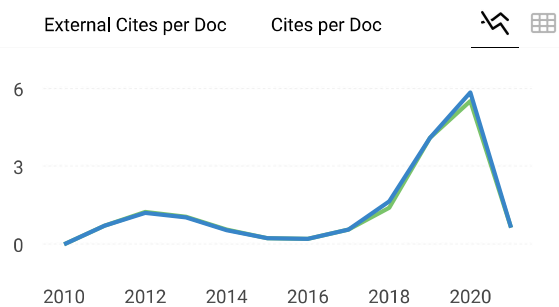
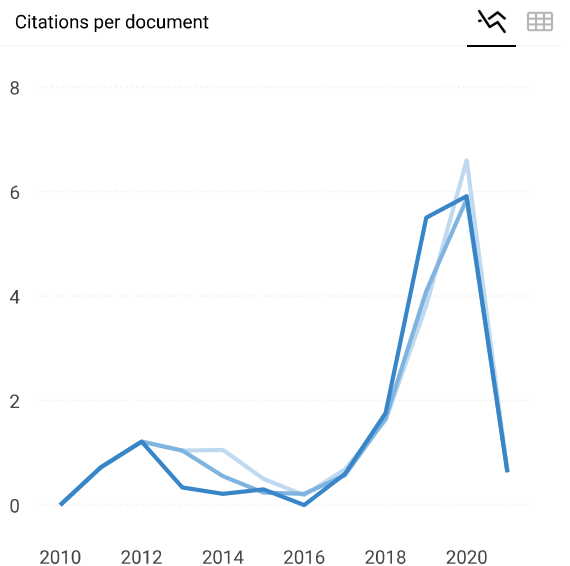
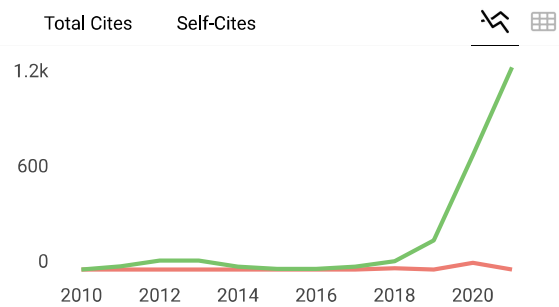
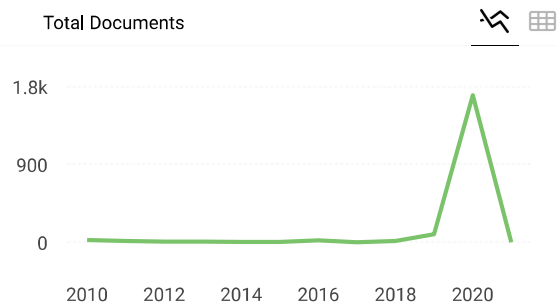
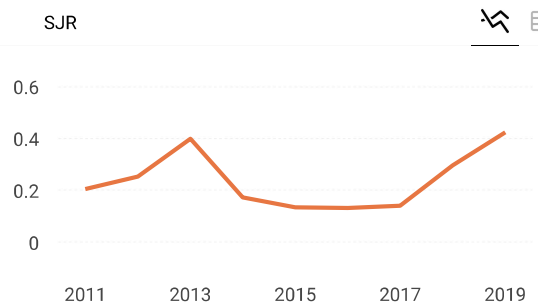
Open




 Quartiles

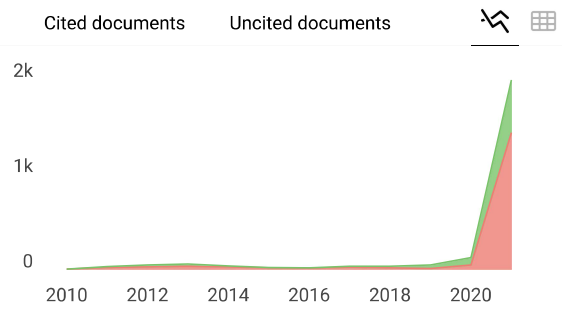
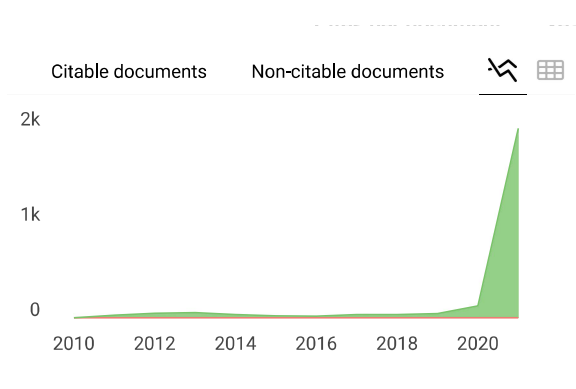


FIND SIMILAR JOURNALS ?

<p>1 <b>Tropical Journal of Pharmaceutical Research</b> NGA</p> <p><b>37%</b> similarity</p>	<p>2 <b>Zhongguo Zhongyao Zazhi</b> CHN</p> <p><b>35%</b> similarity</p>	<p>3 <b>Journal of Applied Pharmaceutical Science</b> IND</p> <p><b>35%</b> similarity</p>	<p>4 <b>International Journal of Pharmacology</b> PAK</p> <p><b>34%</b> similarity</p>
--	--	--	--



-  Cites / Doc. (4 years)
-  Cites / Doc. (3 years)
-  Cites / Doc. (2 years)



**Systematic Reviews in Pharmacy**

Not yet assigned quartile

**SJR 2021**

0

powered by scimagojr.com

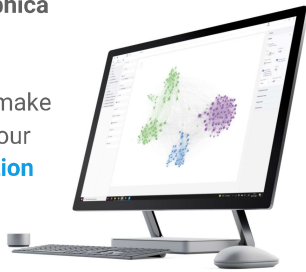
← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimaç
```

**SCImago Graphica**

Explore, visually communicate and make sense of data with our **new data visualization tool**.



R **raphli** 12 months ago

Dear team,

Why the SJR score for this journal is 0 for this year, we have a paper published in this journal last year, at that time it was Q2 journal, however, the score has changed into 0. many thanks

reply



**Melanie Ortiz** 12 months ago

SCImago Team

Dear Raphli, thank you very much for your participation.

Our data come from Scopus/Elsevier, which offers an annual copy of their database. We understand that, since the date indicated by Scopus/Elsevier, the journal is no longer indexed in its database and no data were sent to SCImago to calculate the scientometric indicators.

Best Regards, SCImago Team

N **nova** 12 months ago

This journal is the COVERAGE 2010-2020? its right?

reply



**Melanie Ortiz** 12 months ago

SCImago Team

Dear Nova, thank you very much for your comment. We suggest you consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.

Best Regards, SCImago Team

D **Dr Ehab kamal Ali** 1 year ago

I'm asking about the magazine is in scopus in March 2020 or not and what about its cite score in this date.

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Dr Ehab, thank you very much for your comment. We suggest you consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.

Best Regards, SCImago Team

A **Asim Ahmed** 1 year ago

Why the Journal systematic reviews in pharmacy (SRP) is discontinued in SCOPUS  
Will this decision be revised again and when

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Asim,  
thank you very much for your comment, unfortunately we cannot help you with your request. We suggest you contact Scopus support:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

A **Asim Ahme** 1 year ago

Discontinued in Scopus as of 2020.....is this written by scimago at the website here or it is scam

reply

A **abd nasir** 1 year ago

I have received information that this journal has been active since May 15, 2021, is this true

reply



**Melanie Ortiz** 1 year ago

SCImago Team

Dear Abd Nasir,  
Thank you for contacting us. Could you please expand a little bit on your comment?  
Best Regards, SCImago Team

M **MIK** 2 years ago

Dear Sir this Journal SRP is out of scoups please up date your data because the researchers is dependent on SJR in World and SJR is one of best.

reply





**Melanie Ortiz** 2 years ago

Dear Sir/Madam,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.

For further information, please contact Scopus support:

[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)

Best Regards, SCImago Team

J

**Juliaans Marantika** 2 years ago

Dear SCImago Team,

Would you please write some reason why my Article Politeness in Foreign Language Teaching and Learning Process has been published in this Journal? I need it to provide an explanation regarding the relevance of the journal to my field of specialization, namely language

reply



**Melanie Ortiz** 2 years ago

Dear Juliaans,

thank you for contacting us.

We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.

Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff, so they could inform you more deeply.

Best Regards, SCImago Team

E

**Emilio** 2 years ago

Dear Researchers

This Journal is discontinued from Scopus.

reply



**Melanie Ortiz** 2 years ago

Dear Emilio,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11

June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
For further information, please contact Scopus support:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

R **RAF** 2 years ago

Dear researchers. I have contacted Scopus and Scopus inform me that this journal will be released on the next "discontinued list from scopus". Please be careful.

This journal is published 1500 articles in one year, that most of them not suitable for their "pharmacy scope". This journal also published a social science article. Its weird, isnt it?

reply

A **Arif** 2 years ago

Yes, This journal is not indexed by Scopus in 2021. I have asked Scopus last week



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam, thanks for your participation! Best Regards, SCImago Team

N **رزان** 2 years ago

هل المجلة ضمن سكوبي ام لا .. ارجو الرد

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam, thank you very much for your comment. We suggest you consult the Scopus database directly. Keep in mind that the SJR is a static image (the update is made one time per year) of a database (Scopus) which is changing every day.  
Best Regards, SCImago Team

F **Farah Nargis** 2 years ago

This journal publishes articles only in three days!

What the hell!

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Farah,  
thank you very much for your comment.  
We suggest you contact Scopus regarding this matter here:  
[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)  
Best Regards, SCImago Team

**Yasser Fakri Mustafa** 2 years ago

Dear Sir  
Is this journal still active in Scopus?

I am waiting for your reply,

Best regards

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Yasser,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
Best Regards, SCImago Team

**Iqbal** 2 years ago

I have excellent experience with this journal, they are highly professional in their dealing.  
@ have you make payment through publishing agent or direct to journal.

reply

**Phuong** 2 years ago

This journal have to remove out the scopus journal list as poor contents and no review process (just accept and pay APC). Number of papers is dramatically increase from 2019-2020 vs 2018.  
Poor journal!!!

reply

A **Asim elnour** 2 years ago

Dear Phuong

Can you tell me solid facts.

The Journal is very respected in the content of the research type.

If u say poor be scientific in defining and supporting your comments by facts findings  
...generalization is not accepted in academia publication.

I find the Journal having all aspects of good Journal, from content, scientific merits, peer review and cite score of the articles (3.9).

Scopus does not deal with any Journals not at the criteria stated in Scopus.

R **Researcher** 2 years ago

I am not agree with you. This journal is highly professional in term of publishing good research

P **Phuong** 2 years ago

Please analysis the numbers of papers2017- 2018 vs 2019-2020. Also not only the review papers as scope but also the research articles. The doi is not provide for most of papers. It is a Predatory Journal without peer review process, Just focus on the APC! Please check!



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Phuong,

thank you for your comment.

Our data source is Scopus, SCImago doesn't participate in the journal's selection.

SCImago has no authority to include or exclude SJR journals. We just show the data provided in the latest update by Scopus. Please contact Scopus Support regarding this matter here:

[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)

Best Regards, SCImago Team



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Phuong, thanks for your participation! Could you please tell us the source of that information?

Best Regards, SCImago Team

B **boy** 2 years ago

I'm having a hard time, can you help?  
is the journal listed on Scopus?

reply

A **Ahmad** 2 years ago

Yes dear, its listed in Scopus Q2, and recommended journal for publication



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.

For further information, please contact Scopus support:

[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)

Best Regards, SCImago Team

B **boy** 2 years ago

is this journal still listed on Scopus?  
still active in Scopus?

I am waiting for your reply,

Best regards

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.

For further information, please contact Scopus support:

[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)

Best Regards, SCImago Team

J **jasmine** 2 years ago

hi.i have a review article about the spinal cord injury in children so this can be publish in your journal ?

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Jasmine,

thank you for contacting us.

We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.

Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage (See scope and submission/author guidelines) or contact the journal's editorial staff , so they could inform you more deeply.

Best Regards, SCImago Team

A **Amel Dawod kamel** 2 years ago

this journal will contentious in Scopus because the most of Indian journal discontinuous

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Amel,

Thank you very much for your comment.

All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.

For further information, please contact Scopus support:

[https://service.elsevier.com/app/answers/detail/a\\_id/14883/kw/scimago/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14883/kw/scimago/supporthub/scopus/)

Best Regards, SCImago Team

N **Nabil** 2 years ago

محتاج الايميل ومحتاج اعرف تكلفه نشر الرسائل والابحاث وهل المجله تبع سكوباس

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Nabil,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day. For further information about this journal, please visit the journal's website.  
Best Regards, SCImago Team

R **R.T.AH** 2 years ago

I would like to ask about the index of this journal, is it indexed in Scopus for 2020??  
Thank you in advance

reply



**Melanie Ortiz** 2 years ago

SCImago Team

Dear Sir/Madam,  
Thank you very much for your comment.  
All the metadata have been provided by Scopus /Elsevier in their last update sent to SCImago, including the Coverage's period data. The SJR for 2019 was released on 11 June 2020. We suggest you consult the Scopus database directly to see the current index status as SJR is a static image of Scopus, which is changing every day.  
Best Regards, SCImago Team

S **Supriyono** 2 years ago

Thank's to your informations

reply

M **Manal mohamed ahmed** 2 years ago

كم سعر النشر في هذه المجلة وهل يجوز نشر بحث تخصص تمريض اطفال في هذه المجلة

reply

D **Dr. Raad A. Alharmoosh** 2 years ago

الست منال المحترمة: تفاصيل اجور هذه المجلة موجودة في موقعها الالكتروني كانت سابقاً \$700 أما الان الاجور اصبحت \$850  
ولا أعلم سبب زيادة الاجور



**Melanie Ortiz** 2 years ago

Dear Manal,  
thank you for contacting us.  
Unfortunately, we cannot help you with your request, we suggest you visit the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

**D** **Dr. Fouad Al-Qaim** 2 years ago

Dear Sir/Madam  
As I know this journal is publishing review articles but in some cases I have found research articles. May I know why this conflict?  
Thank you  
  
reply



**Melanie Ortiz** 2 years ago

Dear Dr. Fouad,  
thank you for contacting us.  
We are sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team

**Y** **Yogesh Zambare** 3 years ago

Please send me any processing charges  
  
reply



**Melanie Ortiz** 3 years ago

Dear user,  
  
thank you for contacting us.  
Sorry to tell you that SCImago Journal & Country Rank is not a journal. SJR is a portal with scientometric indicators of journals indexed in Elsevier/Scopus.  
Unfortunately, we cannot help you with your request, we suggest you to go to the journal's homepage or contact the journal's editorial staff , so they could inform you more deeply.  
Best Regards, SCImago Team



### Leave a comment

Name

Email

(will not be published)

 I'm not a robot reCAPTCHA  
Privacy • Terms

Submit

The users of Scimago Journal & Country Rank have the possibility to dialogue through comments linked to a specific journal. The purpose is to have a forum in which general doubts about the processes of publication in the journal, experiences and other issues derived from the publication of papers are resolved. For topics on particular articles, maintain the dialogue through the usual channels with your editor.

Developed by:



Powered by:

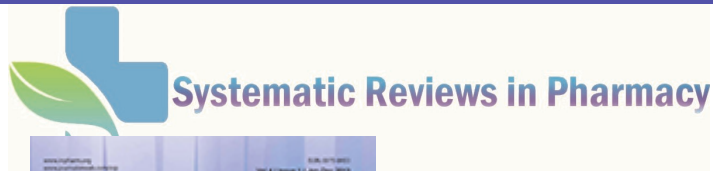


Follow us on @ScimagoJR

Scimago Lab, Copyright 2007-2022. Data Source: Scopus®

EST MODUS IN REBUS  
Horatio (Satire 1,1,106)





25+ Million Readerbase

[Online First](#)[Archive](#)[Aims and Scope](#)[Abstracting & Indexing](#)[Most Accessed Articles](#)[Most Downloaded Articles](#)

ORCID

Crossref

OPEN ACCESS

CC creative commons

[Google Scholar citation report](#)**Citations : 9175**

[Systematic Reviews in Pharmacy received 9175 citations as per google scholar](#)

## Editorial Board

### Editor-in-Chief

Dr. Ayad F. Alkaim  
University of Babylon, College of Science for Women, Babylon, Scopus  
Author ID: 55255310600, Iraq

### Editorial Board

FILIPIC Bratko, PhD  
Professor, Department of Experimental and Translation Oncology  
Croatian Institute for experimental and translation oncology, Zagreb,  
Croatia, Croatia

Dr Lucius, MBBS  
General Practice  
Ludwig Maximilians University Munich, Germany

Dr. Aygul Z. Ibatova  
Department of Natural Sciences  
Tyumen Industrial University, Scopus Author ID:  
57191110632 <http://orcid.org/0000-0003-0565-8533>, Russia

Dr Ahmad Faisal Ismail  
Kulliyyah of Dentistry  
International Islamic University Malaysia, Kuantan Campus, 25200 Kuantan,  
Pahang, Scopus Author ID: 35388596700 , Malaysia

Dr. Huiliang ZHAO, Ph.D  
Guizhou Minzu University, Huaxi District, Guiyang, China

Dr. Mohd Armi Abu Samah  
International Islamic University Malaysia, (IIUM) 25200 Kuantan Pahang

Dr. Baded ramjiÃ  
Sri Lanka

Dr. Chris randea  
South Africa

Dr. Yingwen ZHAO  
Researcher of Guizhou Rural Economic and Social Development Research  
Institute, China

Dr. Li Zihan, Ph.D  
University of Glasgow, UK

Gabriela Cioca  
Faculty of Medicine, Pharmacology Department  
Lucian Blaga University of Sibiu, Romania, Lucian Blaga street, no 2A, Sibiu,  
Romania

Dariusz Nowak  
Municipal Hospital, Mickiewicza street no 12, 42-200 Czestochowa, Poland

[Submit Article](#)[Login](#)[Register](#)

### Most Viewed Articles

Dental Development between Assisted Reproductive Therapy (Art) and Natural Conceived Children: A Comparative Pilot Study Norzaiti Mohd Kenali, Naimah Hasanah Mohd Fathil, Norbasyirah Bohari, Ahmad Faisal Ismail, Roszaman Ramli SRP. 2020; 11(1): 01-06 » doi: 10.5530/srp.2020.1.01

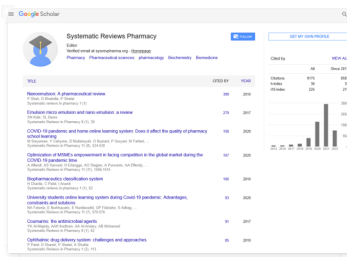
Psychometric properties of the World Health Organization Quality of life instrument, short form: Validity in the Vietnamese healthcare context Trung Quang Vo\*, Bao Tran Thuy Tran, Ngan

### Most Downloaded

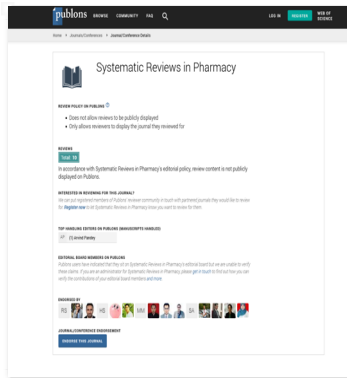
Dental Development between Assisted Reproductive Therapy (Art) and Natural Conceived Children: A Comparative Pilot Study Norzaiti Mohd Kenali, Naimah Hasanah Mohd Fathil, Norbasyirah Bohari, Ahmad Faisal Ismail, Roszaman Ramli SRP. 2020; 11(1): 01-06 » doi: 10.5530/srp.2020.1.01

Manilkara zapota (L.) Royen Fruit Peel: A Phytochemical and Pharmacological Review Karle Pravin P, Dhawale Shashikant C SRP. 2019; 10(1): 11-14 » doi: 0.5530/srp.2019.1.2

report

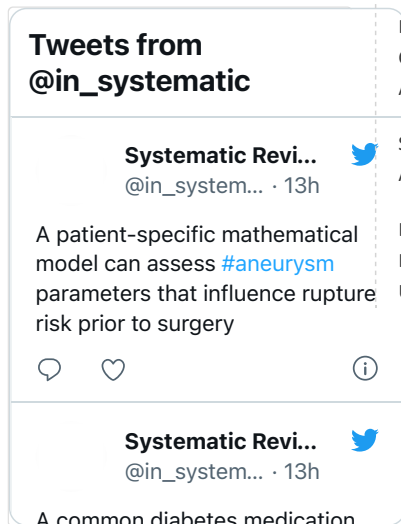


Systematic Reviews in Pharmacy peer review process verified at publons



Indexed In

- > Genamics JournalSeek
- > JournalTOCs
- > China National Knowledge Infrastructure (CNKI)
- > Scimago
- > Ulrich's Periodicals Directory
- > EBSCO A-Z
- > Pollution Abstracts
- > OCLC- WorldCat
- > Proquest Summons
- > ROAD
- > CARI full text



Aleksandra Zyska  
Faculty of Medicine, Department of Physiology  
Opole University, Oleska street no 48, 45-052 Opole, Poland

Katarzyna Sznajder  
Faculty of Medicine, Clinical Department of Diagnostic Imaging  
Opole University, Oleska street no 48, 45-052 Opole, Poland

Jacek Jędrzejewski  
Faculty of Medicine, Department of Family Medicine and Public Health  
Opole University, Oleska street no 48, 45-052 Opole, Poland

Luciano Benedini  
Universidad Nacional del Sur (National University of South-UNS), Bahía Blanca 8000, Argentina

Paula Messina  
Departamento de Biología  
Universidad Nacional del Sur (National University of South-UNS), Bioquímica y Farmacia, Bahía Blanca 8000, Argentina

Michael Walsh  
Washington State University, College of Pharmacy and Pharmaceutical Sciences (CPPS), USA

Prof. Dr. Kittisak Jermittiparsert  
Henan University, China

Amel Dawod Kamel Gudia, PhD  
Faculty of nursing  
Cairo University, Egypt

Arif Nur Muhammad Ansori  
Airlangga University, Scopus Author ID: 57195995342,  
<https://orcid.org/0000-0002-1279-3904>, Indonesia

Mohammed Nader Shalaby  
Suez Canal University, Associate Professor of Biological Sciences and Sports Health, Egypt

Dr. Faten Abo-Aziza Mohamed, PhD  
Associate Professor, Clinical Pathology and Stem Cell Research  
National Research Centre, Manager of Veterinary Division Central Lab (605),  
33 El-Behoos St, Dokki, Cairo, Egypt

Professor Asim Ahmed Elnour Ahmed  
College of Pharmacy  
Al-Ain University of Science and Technology, UAE

S. Parasuraman, M.Pharm., Ph.D  
AIMST University, Malaysia

Ebenezer Wiafe, PhD  
Pharmacy  
University of Kwazulu-Natal, South Africa

Copyright © 2022 Systematic Reviews in Pharmacy All Rights Reserved. Subject to change without notice from or liability to Systematic Reviews in Pharmacy



Copyright © 2022 Systematic Reviews in Pharmacy All Rights Reserved. Subject to change without notice from or liability to Systematic Reviews in Pharmacy. For best results, please use Internet Explorer or Google Chrome

## POLICIES & JOURNAL LINKS

- [Advertising Policy](#)
- [Author's Rights and Obligations](#)
- [Conflict of Interest Policy](#)
- [Digital Archiving & Preservation Policies](#)
- [Editorial Policies](#)
- [Peer Review Policy](#)
- [Editorial & Peer Review Process](#)
- [License Information](#)
- [Plagiarism Policy](#)
- [Privacy Policy](#)
- [Protection of Research Participants \(Statement On Human And Animal Rights\)](#)
- [Publishing Ethics](#)
- [Corrections, Retractions & Expressions of Concern](#)
- [Self-Archiving Policies](#)
- [Statement of Informed Consent](#)
- [Terms of Use](#)

# Correlation between Leprosy Children with Nutritional Status, Personal Hygiene, BCG Vaccination History and Occupancy Density in Gresik Regency

FRS Prakoeswa,<sup>1</sup> DI Haerani,<sup>2</sup> UD Ratnaasri,<sup>2</sup> Budi Prasetyo,<sup>3</sup> Santi Martini,<sup>4</sup> H Soebono,<sup>5</sup> D Husada,<sup>6</sup> HB Notobroto,<sup>4</sup> MY Listiawan,<sup>7</sup> A Endaryanto,<sup>6</sup> CRS Prakoeswa\*<sup>7</sup>

<sup>1</sup> Doctorate Student, Postgraduate Program, Medical Faculty of Airlangga University, Indonesia  
Dermatology and Venereology Department, Medical Faculty of Universitas Muhammadiyah Surakarta, Indonesia

<sup>2</sup> Medical Faculty of Universitas Muhammadiyah Surakarta, Indonesia

<sup>3</sup> Obstetric and Gynecology Department, Medical Faculty of Airlangga University/ Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

<sup>4</sup> Faculty of Public Health, Airlangga University, Indonesia

<sup>5</sup> Dermatology and Venereology Department, Medical Faculty of Gadjah Mada University, Indonesia

<sup>6</sup> Pediatric Department, Medical Faculty of Airlangga University / Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

<sup>7</sup> Dermatology and Venereology Department, Medical Faculty of Airlangga University / Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

**Corresponding Author:** Cita Rosita Sigit Prakoeswa

Department of Dermatology and Venereology, Faculty of Medicine, Airlangga University/Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

Email: [cita-rosita@fk.unair.ac.id](mailto:cita-rosita@fk.unair.ac.id)

## ABSTRACT

Even though Indonesia has achieved elimination status, leprosy is still an important health problem in Indonesia because of its debilitating nature. East Java is one of the provinces with the highest leprosy burden in Indonesia, with a high percentage of children cases. Many factors are thought to affect leprosy transmission. Among them are nutritional status, personal hygiene, BCG vaccination history, and occupancy density. The purpose of this study was to determine the relationship between nutritional status, personal hygiene, BCG vaccination history, and occupancy density with the incidence of leprosy in children in the Gresik Regency. This is an analytic observational research with a case-control approach. This research was conducted in December 2019. The number of samples were 60 respondents, consisting of 30 cases and 30 controls. The results of multivariate analysis showed that there was a relationship between nutritional status ( $p = 0.041$ ; OR = 9,628), history of BCG vaccination ( $p = 0.032$ ; OR = 22,164) and occupancy density ( $p = 0.003$ ; OR = 14,810) with leprosy in children. Nutritional status, personal hygiene, BCG vaccination history, and occupancy density are significantly associated with the incidence of leprosy in children, with occupancy density as the most significant factor and history of BCG vaccination as the strongest risk predictor associated with the development of leprosy in the pediatric population.

**Keywords:** Nutritional status, Personal hygiene, BCG Vaccination, Occupancy Density, Leprosy in children

## Correspondence:

CRS Prakoeswa

Department of Dermatology and Venereology, Faculty of Medicine, Airlangga University/Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

Email: [cita-rosita@fk.unair.ac.id](mailto:cita-rosita@fk.unair.ac.id)

## INTRODUCTION

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*.<sup>1</sup> Leprosy affects various parts of the body, including nerves and skin, which if not getting treatment, will cause damage to the skin, nerves, limbs, and eyes.<sup>2</sup> Currently, leprosy is still a national problem because of its debilitating aspect where leprosy invokes negative stigma to those affected and influences their interaction with the community they belong to.<sup>3</sup>

Leprosy had been reported to affect two to three million people worldwide. The highest number of annual new leprosy cases can be found in India with 134,752 cases, followed by Brazil with 33,303 cases, and Indonesia with 16,825 cases. Leprosy has a disability rate of 6.82 people per million population.<sup>4</sup> Since 2000, Indonesia had achieved leprosy elimination status, when there was less than one case per 10,000 populations. However, this number does not directly translate to Indonesia as a leprosy-free country. In 2015-2016, almost all provinces in eastern Indonesia had a high leprosy burden. East Java is the only Indonesian province in the western part with high leprosy burden.<sup>2</sup> The result of a study on the prevalence of leprosy in the Gresik Regency from 2010 to

2017 shows that there are 140-150 leprosy sufferers. Leprosy prevalence was 1.24 out of every 10,000 populations in 2011, most of which were children (5-7%), with a 12.38% second-grade physical disability rate.<sup>3</sup> Another study showed that in Gresik Regency, there were eight districts with high leprosy case burden, namely: Wiringanom, Tambak, Pancen, Ujungpangkah, Bungah, Sidayu, Shaman, and Kedamean.<sup>3</sup>

Children are believed to be the most vulnerable group towards *M. leprae* infections due to their immature immunity. Many factors are thought to affect leprosy infection, including nutritional status, personal hygiene, BCG vaccination history, and occupancy density. Previous studies reported that nutritional status was correlated with leprosy ( $p$ -value 0.002). Food consumption heterogeneity varies across households, with the same food intake affects the nutritional intake.<sup>5</sup> In contrast with this finding, Hidayatun's study stated that the nutritional status did not have a significant relationship with leprosy (OR 0.210,  $p$ -value 0.148).<sup>6</sup>

Personal hygiene is another factor that also can influence the occurrence of leprosy. Poor personal hygiene will increase body susceptibility towards various skin

infections and can diminish skin barrier function. Poor personal hygiene can be a reflection of the unhealthy environment and individual's behavior.<sup>6</sup>

Another factor that has been reported to correlate with the incidence of leprosy is BCG vaccination history.<sup>7</sup> Bacillus Calmette Guerin vaccine (BCG) is known for its protective effect towards *Mycobacterium tuberculosis* infection, but this vaccine also has been reported to protect against *Mycobacterium leprae* infection. Protection from BCG vaccine for *M. leprae* ranges from 10% to 80%.<sup>8</sup> BCG can increase Th-1 immune response and IFN- $\gamma$  production that is useful for controlling mycobacterium infection. IFN- $\gamma$  is related to macrophage cell activation, increasing Cell-Mediated Immunity (CMI), and destroying *M. leprae*.<sup>9</sup> Research conducted by Mayangsari *et al.*<sup>9</sup> regarding Interferon- $\gamma$  profile and BCG score as an illustration of the immune response in pediatric leprosy patients shows that BCG vaccination protection was only 58%. It means BCG vaccination has not been entirely successful in dealing with leprosy, hence a repeated dose is needed.

The environment has also been thought to play a crucial role in the incidence of leprosy. The environment which affects various aspect of the patient's life is one of the biggest factors contributing to the disease. Occupancy density is part of the physical environment that can affect people's health. Dense housing increases humidity that can promote bacterial growth, including leprosy bacteria.<sup>10</sup> Based on Nurcahyati's study, residents in dense housing have a 6-7 times higher risk of leprosy because they have closer contact with leprosy patients.<sup>11</sup>

Considering several findings that have been stated above, the authors were interested to study the relationship between nutritional status, personal hygiene, BCG vaccination history, and occupancy density with the incidence of children leprosy in the Gresik Regency. This study hopefully can shed some clues for a better leprosy eradication strategy which will be focused not only on the therapeutic aspect but also on promotive and preventive efforts to break the chain of leprosy transmission.

#### MATERIALS AND METHODS

This research was conducted in Gresik Regency on 19-23 December 2019 using an analytic study with a case control design. Consecutive sampling technique was used to

obtain the sample. This study involves leprosy patient from children aged 5-18 years who were willing to be the research subjects. Sample allocated were 30 cases of leprosy patients and 30 controls who did not have leprosy. Data collection was carried out with interviews accompanied by the respondent's parents. The type of data collected were separated into two, namely primary data (obtained through observation and interviews with respondents) and secondary data (obtained through data from the Gresik Regency Health Office).

Interview were conducted to obtain nutritional status, personal hygiene, BCG vaccination history, and residential density data. Nutritional status was defined using WHO criteria for BMI based on age with  $<-3$  SD,  $-3$  SD to  $<-2$  SD,  $> 1$  SD to  $2$  SD,  $> 2$  SD categorized as abnormal nutritional status and  $-2$  SD to  $1$  SD categorized as normal. Personal hygiene was assessed using a personal numeric scale from 1 to 10 with  $<5$  score considered as poor personal hygiene and  $\geq 5$  considered good personal hygiene. BCG vaccination history was obtained from the BCG score and the MCH handbook which categorize the study subject into vaccinated and not vaccinated groups. Assessment of residential density was done by direct observation. The design of this study was approved by the Health Research Ethics Commission Dr. Soetomo Surabaya (Number: 1664 / KEPK / XI / 2019). The final data were analyzed using SPSS with univariate analysis using frequency distribution, bivariate analysis using chi-square test and multivariate analysis using logistic regression test with a value of  $\alpha = 0.05$ .

#### RESULTS

The data were retrieved from 60 subjects, amongst whom 30 contracted leprosy and 30 were the control group. Table 1 shows the general characteristics of the subjects. A quarter (15/60) of the subjects have an abnormal nutritional status and 15% (9/60) of subjects did not undergo BCG vaccination. Meanwhile, personal hygiene splits at the same percentage between those with good habits and those who did not have. During the study period, we also found that 60% (36/60) of the subjects' household did not meet the minimum recommended density; in other words, they lived in a cramped housing environment.

**Table 1.** Demographic Characteristics of Respondents

Variable	Frequency	%
Child Leprosy		
Leprosy	30	50
No leprosy	30	50
Nutritional status		
Abnormal	15	25
Normal	45	75
Personal Hygiene		
Less	30	50
Good	30	50
History of BCG Vaccination		

No	9	15
Yes	51	85
Household Density		
Didn't meet the requirement	36	60
Meet the requirement	24	40

**Table 2.** Results of Bivariate Analysis of Chi-Square Test

Variable	Child Leprosy Condition				p-value	OR
	Leprosy		Without leprosy			
	N	%	N	%		
<b>Nutritional status</b>						
Abnormal	12	20	3	5	0.007	6.00
Normal	18	30	27	45		
<b>Personal Hygiene</b>						
Less	20	33.3	10	16.7	0.010	4.00
Good	10	16.7	20	33.3		
<b>History of BCG Vaccination</b>						
No	8	13.3	1	1.7	0.026	10.55
Yes	22	36.7	29	48.3		
<b>Household Density</b>						
Meet the requirement	26	43.3	10	16.7	0.000	13.00
Didn't meet the requirement	4	6.7	20	33.3		

The results from statistical analysis were shown in table 2 as well as the frequency amongst leprosy and non-leprosy group regarding each of the variables. All variables show a significant difference between the children with leprosy and those without leprosy i. e. nutritional status ( $p=0.007$ ), personal hygiene ( $p=0.010$ ), history of BCG vaccination ( $p=0.026$ ), and occupancy density ( $p=0.000$ ).

Subjects with leprosy accounted for 80% (12/15) of those with abnormal nutritional status. Given the OR value, children with poor nutritional status is at six times higher in odds to develop leprosy compared to the children with normal nutritional status. On personal hygiene, half of the

subjects had poor personal hygiene, amongst whom 33.3% (20/60) had leprosy.

Most of children without prior BCG vaccination (7/8) were in leprosy group. The statistical analysis showed that children with no history of BCG vaccination possess a higher odd about ten times compared to their counterpart who underwent the immunization. The subjects whose occupancy density did not fulfill the requirement only constituted 15.38% (4/26) of leprosy cases. However, the Chi square test showed statistical differences amongst pediatric population with leprosy and those without leprosy ( $p=0.000$ ; OR 13.00).

**Table 3.** Results of Multivariate Analysis using Logistic Regression Test

Independent variable	OR exp (B)	95% CI for Exp (B)	Sig
Nutritional status	9,628	1,094-84,763	0.041
<i>Personal Hygiene</i>	4,525	0889-22,786	0.067
History of BCG Vaccination	22,164	1,302-377,282	0.032
House Occupancy Density	14,810	2,476-88,567	.003

Multivariate analysis by logistic regression was done to observe the strength of each parameters i. e. nutritional status, personal hygiene, history of BCG vaccination, and occupancy density. The result were presented on table 3. It was showed that the most significant factor was occupancy density ( $p=0.003$ ), whilst prior BCG vaccination ( $p=0.032$ ) is shown to be the most determining factor. Subjects whose occupancy density did not meet the minimum requirements and those who never underwent BCG vaccination had an increased risk of leprosy by 14,810 times and 22,164 times, respectively.

## DISCUSSION

This study implied that there is a significant relationship between nutritional status and the incidence of leprosy in children. The result is in accordance with a previous study conducted in Sampang Regency in 2018 that observed significant association between nutritional status and the incidence of leprosy.<sup>6</sup> In addition, another study conducted in Sampang Regency in 2017 also observed a significant relationship between nutritional status and the incidence of leprosy<sup>12</sup>. Nutritional status is one of the factors that can increase the risk of leprosy infection. The previous study suggests that inadequate nutrient intake



can affect the immune response and thus render the body to be more susceptible to contract *M. leprae*.<sup>13,14</sup>

A significant relationship between personal hygiene and the incidence of leprosy in pediatric patients was also observed in this study. Personal hygiene such as overall body hygiene, hair, mouth, skin, eyes, nose, ears, and genitals are known to affect health. Previous studies have also shown significant results.<sup>6,15</sup>

Prior BCG vaccination is showed to be a strong predictor, with the most significant risk associated with the incidence of leprosy in children. Our study found that the children who did not undergo BCG immunization have an OR exp (B) of 22,164 times to contract leprosy. BCG is the only vaccine known to prevent leprosy and plays an important role in controlling leprosy.<sup>13,17</sup> Previous study conducted by Susanti and Azam<sup>7</sup> also observed that people who do not have a history of BCG vaccination tend to develop leprosy later in life compared to those who had undergone the immunization. However, in this study, 26 subjects with prior BCG vaccination but still had leprosy, which is more in number compared to those with leprosy but have never receive BCG immunization. It is thought that multiple BCG immunization of revaccination is needed to protect against *M. leprae*. A booster dose of BCG is believed to help reduce the risk of leprosy. Previous study showed that the protection rate of BCG were found to be 41% in experimental studies and 60% in cohort studies.<sup>16</sup> A study in Brazil revealed the protective effect of BCG vaccination against leprosy varies from 20% to 80%<sup>17</sup>. Other studies in Uganda, Guinea and India obtained protection rates of 81% with a year follow up, 46% after 9 years and 23% after 10 years, respectively. In addition, a meta-analysis study reported the rate of protection for BCG revaccination varied between 26-61%. This procedure is proved to be effective against the development of MB type of leprosy. Besides, another study suggests that BCG revaccination is recommended for people with contact with MB patients, as they have a very high risk to develop infection<sup>18</sup>.

Our study also found that occupancy density was the most significant factor associated with the incidence of leprosy in children ( $p$ -value = 0.003). Wicaksono *et al* [19] also reported that there was a significant influence between the density of house occupancy with leprosy incidence (OR=4.42; 95% CI = 1.25-15.57).<sup>19</sup>

#### CONCLUSIONS AND SUGGESTIONS

It can be concluded that nutritional status, personal hygiene, BCG vaccination history, and occupancy density are significantly associated with the incidence of leprosy in children. The most significant factor associated with the development of leprosy in the pediatric population is occupancy density whereas the strongest risk predictor is no prior BCG vaccination. Our study suggests the importance of raising awareness regarding occupancy density, educating the public about the importance of BCG vaccinations and BCG booster vaccination program, and the importance of applying Clean and Healthy Living Behavior in the community.

#### ACKNOWLEDGEMENTS

I would like to thank the leprosy officers, doctors, and staff of the Gresik District Health Office, East Java Province.

#### FUNDING STATEMENT

The author(s) received no financial support for the

research, authorship, and publication of this article.

#### DATA AVAILABILITY

The Questionnaire data used to support the findings of this study are included within the supplementary information files.

#### REFERENCES

1. I. Wisnu, "Kusta," in *Ilmu Penyakit Kulit dan Kelamin*, Jakarta: Badan Penerbit FK UI, 2017, pp. 87–102.
2. Ministry of Health, "Eliminate stigma and discrimination towards leprosy," *Infodatin*, 2018.
3. Shofiyah, A. B. Tamam, and S. Fahimah, "Kusta dan Permasalahannya: Studi Sosiologis di Desa Banyuurip Ujungpangkah Gresik," *Media Komunikasi Sosial Keagamaan*, vol. 17, no. 1. pp. 139–154, 2017.
4. WHO, *Guidelines for the Diagnosis, Treatment and Prevention of Leprosy*, vol. 1. 2017.
5. S. Oktaria, N. S. Hurif, W. Naim, H. B. Thio, T. E. C. Nijsten, and J. H. Richardus, "Dietary diversity and poverty as risk factors for leprosy in Indonesia: A case-control study," *PLoS Negl. Trop. Dis.*, vol. 12, no. 3, 2018.
6. A. H. N, N. Haidah, and A. D. Nerawati, "HUBUNGAN KARAKTERISTIK INDIVIDU DENGAN KEJADIAN PENYAKIT KUSTA (Studi Kasus di Wilayah Kerja Puskesmas Tanjung Kabupaten Sampang Tahun 2018)," *Gema Kesehat. Lingkungan*, vol. 16, no. 1, pp. 274–281, 2018.
7. K. N. Susanti and M. Azam, "Hubungan Status Vaksinasi Bcg, Riwayat Kontak Dan Personal Hygiene Dengan Kusta Di Kota Pekalongan," *Unnes J. Public Heal.*, vol. 5, no. 2, p. 130, 2016.
8. M. Romero-Montoya, J. C. Beltran-Alzate, and N. Cardona-Castro, "Evaluation and Monitoring of Mycobacterium leprae Transmission in Household Contacts of Patients with Hansen's Disease in Colombia," *PLoS Negl. Trop. Dis.*, vol. 11, no. 1, 2017.
9. R. Mayangsari, I. Zulkarnain, and T. Setyaningrum, "Profil Interferon- $\gamma$  dan Skar BCG sebagai Gambaran Respons Imun pada Pasien Kusta Anak ( The Profile of Interferon- $\gamma$  and BCG Scar as an Immune Response Reflection in Children with Leprosy )," vol. 28(3), 2016.
10. R. Ratnawati, "Faktor-Faktor Yang Berhubungan Dengan Risiko Kejadian Morbus Hansen," *Tunas Ris. Kesehat.*, vol. VI, no. 3, pp. 103–109, 2016.
11. S. Nurcahyati, H. B. N, and A. Wibowo, "Sebaran Kasus Kusta Baru Berdasarkan Faktor Lingkungan dan Sosial Ekonomi Di Kecamatan Konang dan Geger Kabupaten Bangkalan," *J. Wiyata*, vol. 3, no. 1, pp. 92–99, 2016..
12. E. Zuhdan, K. Kabulrachman, and S. Hadisaputro, "Faktor-Faktor yang Mempengaruhi Kejadian Kusta Pasca Kemoprofilaksis (Studi pada Kontak Penderita Kusta di Kabupaten Sampang)," *J. Epidemiol. Kesehat. Komunitas*, vol. 2, no. 2, p. 89, 2017.
13. T. Narang and B. Kumar, "Leprosy in Children," *Indian J Paediatr Dermatol*, vol. 20, pp. 12–24, 2019.
14. I. Wagenaar *et al.*, "Diet-Related Risk Factors for Leprosy: A Case-Control Study," *PLoS Negl. Trop. Dis.*, 2015.
15. Kasiati, N. R, *Kebutuhan Dasar Manusia*. Jakarta: Kementerian Kesehatan Republik Indonesia, 2013.
16. T. Narang and B. Kumar, "Leprosy in Children," *Indian J Paediatr Dermatol*, vol. 20, pp. 12–14, 2019.

17. J. G. Barreto, M. A. C. Frade, F. Bernardes Filho, M. B. da Silva, J. S. Spencer, and C. G. Salgado, "Leprosy in Children," *Current Infectious Disease Reports*, vol. 19, no. 6, 2017.
18. M. B. B. de Oliveira and L. M. Diniz, "Leprosy among children under 15 years of age: Literature review," *Anais Brasileiros de Dermatologia*, vol. 91, no. 2, pp. 196–203, 2016.
19. M. Wicaksono, A. Faisya, and I. Budi, "Physical Environment Home and Characteristics of Respondents Related To the Disease of Leprosy Clinical in the City of Bandar Lampung," *J. Ilmu Kesehatan. Masy.*, vol. 6, no. 3, pp. 167 – 177, 2015.