THE POSITIVE DEVIANCE APPROACH ON THE INCIDENCE OF MALARIA IN ENDEMIC AREAS; LITERATURE REVIEW

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ABSTRACT

Background: This literature review study is motivated by the empirical phenomenon of malaria incidence which is becoming more serious from time to time. The incidence of malaria has a social impact in the form of public unrest due to the fast course of the disease and can cause death in a short time, as well as an economic impact, namely an increase in the state budget for the treatment of malaria.

Purpose: This literature is intended to identify and describe evidence related to the positive deviation (PD) malaria control model as a new strategy in accelerating malaria reduction.

Theoretical Framework: This research was conducted using a theoretical framework collected from various sources using the Lawrence Behavior Theory approach. In this theory it is explained that there are 3 main things that influence behavior and behavior change, namely predisposing factors, enabling and reinforcing factors. These three factors influence the potential knowledge, attitudes and practices of malaria control in endemic areas. In practice, a communication model is applied, including behavioral intention through a three-burner approach.

Methods: The literature review method was conducted using the 2015 Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines by searching comprehensive peer-reviewed articles from three computerized bibliographic databases: Scopus, PubMed, and EBSCO. Strengthening the reporting of observational studies in Epidemiology (STROBE) checklist used as a guide to assess the quality of the studies reviewed.

Findings: The results of the review articles are in the form of Positive Deviance (PD) approach method of solving health problems, especially malaria and assisting the government in malaria control programs in people living in endemic areas.

Practical Implication: Through this positive deviance approach method, the community is encouraged to identify, recognize, and know things related to the causes of malaria, malaria transmission, and steps to prevent malaria in the community..

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A ABORDAGEM POSITIVA DO DISPOSITIVO SOBRE A INCIDÊNCIA DA MALÁRIA EM ÁREAS ENDÊMICAS; REVISÃO DA LITERATURA

RESUMO

Antecedentes: Este estudo de revisão da literatura é motivado pelo fenômeno empírico da incidência de malária, que está se tornando mais grave de tempos em tempos. A incidência de malária tem impacto social na forma de agitação pública devido ao curso rápido da doença e pode causar morte em pouco tempo, além de impacto econômico, que é o aumento do orçamento do estado para o tratamento da malária.

Finalidade: Esta literatura tem como objetivo identificar e descrever evidências relacionadas ao modelo de controle de desvio positivo (PD) da malária como uma nova estratégia de aceleração da redução da malária.

Estrutura Teórica: Esta pesquisa foi conduzida usando uma estrutura teórica coletada de várias fontes usando a abordagem da Teoria do Comportamento de Lawrence. Nesta teoria explica-se que existem 3 coisas principais que influenciam o comportamento e a mudança de comportamento, ou seja, fatores predisponentes, fatores capacitantes e reforçadores. Esses três fatores influenciam o conhecimento, atitudes e práticas potenciais de controle da malária em áreas endêmicas. Na prática, é aplicado um modelo de comunicação, incluindo a intenção comportamental através de uma abordagem de três queimadores.

Métodos: O método de revisão de literatura foi realizado usando as diretrizes Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) de 2015, pesquisando artigos abrangentes revisados por pares de três bases de dados bibliográficas computadorizadas: Scopus, PubMed e EBSCO. Reforço da comunicação de estudos observacionais em Epidemiologia (STROBE) lista de verificação utilizada como um guia para avaliar a qualidade dos estudos revisados.

Constatações: Os resultados dos artigos de revisão estão na forma de método de abordagem de Desvio Positivo (PD) para resolver problemas de saúde, especialmente a malária, e ajudar o governo em programas de controle da malária em pessoas que vivem em áreas endêmicas.

Implicação Prática: Através deste método de abordagem de desvio positivo, a comunidade é incentivada a identificar, reconhecer e saber coisas relacionadas com as causas da malária, a transmissão da malária e os passos para prevenir a malária na comunidade.

Palavras-chave: malária, desvio positivo, revisão da literatura, área endêmica.

1 INTRODUCTION

Malaria is an infectious disease which is still a public health problem around the world, including in Indonesia. The diseases is caused by *Protozoa Genus Plasmodium* which is transmitted through mosquito bites, striking almost all regions around the world (Arsin, AA, 2012). Globally, it is estimated that in 2020 there will be 241 million cases of malaria in 85 malaria-endemic countries, an increase from 2019, namely 227 million cases, with most of this

increase coming from countries in the African region. Deaths from malaria in 2020 increased by 12% compared to 2019, to around 47,000 deaths (68%) caused by service disruptions during the Covid-19 pandemic (WHO, 2021). Meanwhile, the Southeast Asia Region including Indonesia, until 2020 is still a malaria endemic country and ranks as the second highest country with the highest number of malaria cases in the Southeast Asia region. Therefore, Indonesia has a big task in efforts to control malaria transmission in order to create a malaria-free country by 2030 (WHO, 2021).

The Eradication of Malaria Movement (Gebrak) which began in 2012 has a vision of creating an environment free from malaria transmission through empowering communities to live healthy lives and protect themselves from malaria transmission, building partnerships in eradicating malaria and ensuring quality health services for prevention and malaria treatment (Arsin, AA, DKK, 2012). Prevention of malaria requires the active participation of the community so community empowerment is important to reduce the incidence of malaria. Community empowerment will greatly assist the government in the success of DHF preventive efforts so that malaria can be controlled (Arsin, AA, 2012) (Trapsilowati, 2015 & Sukses, 2018).

Masunaga et al (2021) stated that community involvement as malaria cadres in Cambodia influenced the malaria control program for this group (Masunaga et al., 2021). Several studies have shown the importance of community participation in malaria control efforts in the context of achieving malaria elimination itself. Adhikari et al (2017) and Van den Berg et al (2018) in their research concluded that the involvement of human resources in malaria control in the context of malaria elimination is one of the key elements in malaria control (Adhikari et al., 2017) (Van Den Berg et al., 2018).

Behavior is the biggest factor that affects a person's health, including the incidence of malaria. According to Notoatmodjo (2012), health behavior is formed from individual characteristics, whereas according to Ompusunggu, behavior is formed from sociodemographic characteristics, population mobility, environmental conditions and human behavior (Pujiyanti & Widiarti, 2012). Therefore, it is necessary to implement the right strategy to reduce the incidence of malaria. One alternative solution to resolve the problem can be done by applying the positive deviance approach.

Positive deviance (PD) is an approach to behavior change, based on the assumption that some solutions to problems faced by society in principle already exist within the community itself and only need to be found. Basically, positive deviance focuses on the behavior of local people (Ayubi, Rahayu, & Yulianti, 2013). Research conducted by Lim et al. (2017) in Cambodia and by Naing et al. (2017) in Myanmar showed that the behavior of preventing
malaria carried out by the community was using mosquito nets while sleeping, burning garbage, wearing long sleeves, using mosquitoes coils or repellent.

The positive deviance approach can be an effective tool for changing people's behavior in the context of controlling and eliminating malaria incidence in an area by strengthening the community (Shafique et al., 2016).

Limited number of research recommend the PD approach as a new strategy for controlling malaria in Indonesia, especially for population groups at high risk of malaria transmission. Significant research has been done on the PD approach but it is only limited to maternal and child health control programs (Core, 2014).

Anggraeni and Nurrachmawati (2020) conducted research and showed that the PD approach can be used as a way to prevent malaria in pregnancy (Anggraeni & Nurrachmawati, 2020). Research conducted by Arsunan, et al shows that PD behavior can be used as an effort to prevent and control malaria in the Selayar Islands, Indonesia (Arsin, AA et al., 2020). Similar research was also conducted in Pangkep district, Indonesia showing that PD behavior is one of the strategies that can be used to prevent and control DHF in the region (Muis et al., 2020).

Malaria is an endemic disease in Jayapura City, Papua Province. Data from the Disease Prevention and Control (P2P) Division Jayapura City Health Office (2021), the number of positive cases of malaria based on the results of blood smear examination in 2020 was 46 cases, in 2021 it increased to 64 cases, and in 2022 it also increased to 94 cases. The increase in cases in 2021 is due to the presence of 59 local cases. Beginning in 2022, there were 50 positive cases of malaria in Jayapura Selatan District, Jayapura City.

On the basis of this phenomenon, this literature review was conducted to identify and describe evidence related to the positive deviation (PD) model of malaria control as a new strategy for accelerating malaria reduction. In this case, through the positive deviance approach method, the community is encouraged to identify, recognize, and know things related to the causes of malaria, the transmission of malaria, and steps to prevent malaria in the community.

The research question in this study “Is the Positive Deviance (PD) approach to prevent and control malaria in endemic areas an effective strategy to accelerate the elimination of malaria in Jayapura City, Papua Province?”

2 THEORICAL FRAMEWORK

This research was conducted using a theoretical framework collected from various sources using the Lawrence Behavior Theory approach. In this theory it is explained that there are 3 main things that influence behavior and behavior change, namely predisposing factors,
enabling and reinforcing factors. These three factors influence the potential knowledge, attitudes and practices of malaria control in endemic areas. In practice, a communication model is applied, including behavioral intention through a three-burner approach. The Positive Deviance approach is an approach that is used through a series of activities which in turn are expected to have a positive effect on malaria prevention and control programs in endemic areas of Jayapura City, Papua Province (Figure 1).

![Lawrence L. Green’s Theoretical Framework in Notoadmodjo (2003)](image)

**Figure 1. Lawrence L. Green’s Theoretical Framework in Notoadmodjo (2003)**

**METHODS**

This literature review was conducted using the 2015 Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Moher et al., 2015). Make a list of relevant words Medical Subject Headings (MeSH) and keyword subtitles were generated and used to search comprehensive peer-reviewed articles from three computerized bibliographic databases: Scopus, PubMed, and EBSCO. The search includes research conducted worldwide and published between January 2012 and November 2022. Articles retrieved from each database are imported into the Mendeley Library. For additional relevant publications that may have been missed, we searched for bibliographical references of all articles retrieved that met the inclusion criteria, supplemented by citation tracking using Google Scholars.

The research criteria included in this review are if the research: 1) focuses on people in endemic areas with the highest cases; 2) analyzes the factors associated with the incidence of
Malaria and its prevention; 3) issued between 2012 and 2022; 4) written in English; 5) the data is analyzed with the Multivariate Regression Model, Multilevel Analysis Model, and Predictive Model Classification Tree Analysis, Cox proportional hazards models (qualitative studies, case studies, books, policy briefs or theses were excluded from review); and 6) published in a peer-reviewed journal (non-peer reviewed research, reviews or comments excluded).

All articles identified by searching were extracted and exported to the Mendeley Library and duplicates were removed. Furthermore, all publications were screened by reading the title and abstract. In the final screening phase, the full text was read from the remaining articles and retained the studies that met the inclusion/exclusion criteria. All data extraction and assessment studies taken were assessed independently. A summary of selected studies is recorded, this includes; author, year of publication, country of study, number of samples, forms of intervention in malaria cases and quality assessment scores.

Strengthening the reporting of observational studies in Epidemiology (STROBE) checklist (von Elm et al., 2014) was used as a guide to assess the quality of the studies reviewed. The checklist consists of 22 items used to evaluate the external validity (based on potential selection bias) and internal validity (based on potential measurement bias and confounding) of observational studies. After an initial assessment of all reviewed studies against the 22 STROBE items, the items were then grouped into 8 quality assessment criteria: sample size, sampling methodology, response rate, outcome measure statistical analysis, study limitations, ethical considerations, and controls for confounding. The score assigned to each study reviewed ranges from 0 to 8 points (0 if none of the criteria is met and 8 points if all criteria are met).

4 RESULTS

4.1 DATA ANALYSIS

Data analysis was performed using the 2015 Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines resulting in a total of 4067 articles taken from several databases. After duplicate deletion, 2850 articles were retained. Based on the results of the title screening, 2451 articles were issued. Abstracts of the resulting articles were read and filtered so that 326 articles were excluded. Then the full text of the article was read and 54 articles were excluded. 19 articles met the inclusion criteria. A bibliographical reference manual search of the saved articles identified an additional 0 articles for a total of 19 articles (Figure 2).
4.2 CRITICAL APPRAISAL

Critical appraisal/critical review using the JBI Critical Appraisal for Experimental Studies included in the inclusion criteria totaling nineteen (19) articles. The discussion of each article can be seen in Table 1.

4.3 LITERATURE REVIEW

The results of the literature review regarding positive deviance and its influence on the incidence of malaria are done by making an analysis matrix. The summary results indicate that the Positive Deviance (PD) approach can be used as a way to prevent malaria. Shafique., et al. (2016b). This result is also reinforced by Adhikari, et al. (2017) whereas community involvement in this matter Positive Deviance exist in the community and confirmed to be an effective component in the elimination of malaria. Likewise, the results of Bennett’s research, et al. (2017) pointed out the importance of involving private sector stakeholders from an early stage have positive impact of community behavior (positive deviance) in the development of malaria elimination strategies.

Figure 2. Flow Chart Study Based on PRISMA 2015 Guideline

Source: Prepared by Authors
<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Model</th>
<th>Authors</th>
<th>Quality of Assessment (0-8 points)</th>
<th>Determinants of Malaria Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Identification and strengthening of positive deviance: an effort to reduce the incidence of malaria in selayar islands</td>
<td>A.A. Lies (2020)</td>
<td>High Quality (7)</td>
<td>Positive Deviance with the use of Long Sleeve Shirts</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Immunogenicity and safety of one-dose human papillomavirus vaccine compared with two or three doses in Tanzanian girls (DoRIS): an open-label, randomised, non-inferiority trial</td>
<td>Deborah Watson-Jones., et al (2022)</td>
<td>Medium Quality (5)</td>
<td>Administration of the HPV 16 vaccine or the HPV 18 vaccine</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>The effectiveness of non-pyrethroid insecticide-treated durable wall lining to control malaria in rural Tanzania: study protocol for a two-armed cluster randomized trial</td>
<td>George Mtove (2016)</td>
<td>Medium Quality (6)</td>
<td>Insecticidal wall lining and insecticidal netting are durable</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Evaluation of alternative mosquito control measures on malaria in Southern Ghana</td>
<td>Charles Yaw Okyere (2021)</td>
<td>Medium Quality (5)</td>
<td>The use of insecticides did not significantly affect the reduction in malaria cases, but if the use of insecticides was combined with the use of insecticide nets there was a significant reduction in cases.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Bed net use and malaria treatment-seeking behavior in artisanal gold mining and sugarcane growing areas of Western Kenya highlands</td>
<td>Kipcho Mukabane., et al (2022)</td>
<td>Medium Quality (6)</td>
<td>Use of insecticide nets and administration of drugs (Paracetamol, ibuprofen)</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Study Type</td>
<td>Authors</td>
<td>Quality</td>
<td>Notes</td>
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</tr>
<tr>
<td>10</td>
<td>Pharmacovigilance reporting during seasonal malaria chemoprevention campaign: Findings from northern Nigeria</td>
<td>Quantitative</td>
<td>Kunle Rotimi., et al (2022)</td>
<td>Medium Quality (6)</td>
<td>SMC (Seasonal Malaria Chemopreventive) program with drug administration</td>
</tr>
<tr>
<td>11</td>
<td>Reduced blood-stage malaria growth and immune correlates in humans following RH5 vaccination</td>
<td>Experimental/ Clinical Trial</td>
<td>Angela M. Minassian., et al (2021)</td>
<td>Medium Quality (5)</td>
<td>Administration of RH5 Vaccine</td>
</tr>
<tr>
<td>12</td>
<td>Improved housing versus usual practice for additional protection against clinical malaria in The Gambia (RooPfs): a household-randomised controlled trial</td>
<td>Randomised controlled study</td>
<td>Margaret Pinder., et al (2021)</td>
<td>Medium Quality (5)</td>
<td>Modification of the house by using a metal roof and screen doors and windows</td>
</tr>
<tr>
<td>14</td>
<td>Community-based malaria control in southern Malawi: a description of experimental interventions of community workshops, house improvement and larval source management</td>
<td>Experiment</td>
<td>Van Den Berg, et al. (2018)</td>
<td>Medium Quality (5)</td>
<td>Three new interventions in malaria prevention and control are described. The intervention consists from the organizational structure local, educational and collective action, and incorporates elements of problem identification, planning and evaluation.</td>
</tr>
<tr>
<td>15</td>
<td>An integrated malaria control program with community participation on the Pacific Coast of Colombia.</td>
<td>Quasy Experience</td>
<td>Rojas, Botero, and Garcia (2005)</td>
<td>Medium Quality (5)</td>
<td>Society participation as one of the important component evaluated in a malaria control program on the Gold Coast of Colombia</td>
</tr>
<tr>
<td>16</td>
<td>Elements of effective community engagement: lessons from a targeted malaria elimination study in Laos PDR</td>
<td>Qualitative Study</td>
<td>Adhikari, et al. (2017)</td>
<td>Medium Quality (5)</td>
<td>Engagement activities part society pre-designed is the effective component but doing formative research and Sustainability is the key to being able to adapt with the needs of local communities.</td>
</tr>
<tr>
<td>17</td>
<td>Eliminating malaria in Malaysia: the role of partnerships between the public and commercial sectors in Sabah</td>
<td>Qualitative Study</td>
<td>Sanders, et al. (2014)</td>
<td>Medium Quality (5)</td>
<td>Partnerships with the commercial sector have contributed to the reduction of malaria, including participation public</td>
</tr>
<tr>
<td>18</td>
<td>Engaging the private sector in malaria surveillance: a review of strategies and</td>
<td>Mix Method</td>
<td>Bennett, et al. (2017)</td>
<td>Medium Quality (5)</td>
<td>This review highlights the importance of being involved</td>
</tr>
</tbody>
</table>
5 DISCUSSION

Findings on literature review. This approach is carried out using a theoretical framework collected from various sources using the Lawrence Behavior Theory approach. In this theory it is explained that there are 3 main things that influence behavior and behavior change, namely predisposing factors, enabling and reinforcing factors. These three factors influence the potential knowledge, attitudes and practices of malaria control in endemic areas.

In practice, a communication model is applied including behavioral intention through a Positive Deviance approach. The Positive Deviance is an approach that is used through a series of activities which in turn are expected to have a positive effect on malaria prevention and control programs in endemic areas. The intervention given to the target group (sample) is malaria case management training which is added to the Positive Deviance approach. Meanwhile, the control group was given a conventional approach.

The Positive Deviance (PD) approach method is a method of solving health problems, especially malaria in the community in assisting the government in malaria control programs in people living in endemic areas. Through this approach, the community is invited to identify, recognize and know things related to the causes of malaria, transmission of malaria and steps to prevent malaria in the community.

The Positive Deviance behavior are expected to produce new policy methods or principles in carrying out malaria prevention and control programs, as well as for the development of public health science, especially in the prevention and control of tropical diseases.
Solutions found within a community can be more sustainable than solutions from outside that are brought into the community. *Positive deviance* based on the assumption that several solutions to overcome health problems already exist in the community, it only needs to be observed to find out the forms of positive deviations that exist from the community's behavior.

### 6 CONCLUSION

Conclusions from the literature review as well as the goals set, namely how to influence *Positive Deviance* regarding the incidence of malaria in endemic areas, it can be concluded that malaria is one of the communicable diseases that is a major concern in the world and in Indonesia. Apart from being related to population morbidity and mortality, malaria also has an impact on human productivity. Malaria is a preventable infectious disease, and it's very easy to do.

Prevention of malaria can be done in various ways including by involving the community, so that people can learn and take action to prevent malaria. In the context of controlling and accelerating the reduction and elimination of malaria, *Positive Deviance* approach can be the problem-solving method which shown to be an effective strategy for long-term for locals, migrant and mobile community groups in assisting the government to achieve the goal of controlling and accelerating the reduction and elimination of malaria.
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