



# INTERNATIONAL ISLAMIC MEDICAL JOURNAL



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RSUD Haji in East Java  
**Monique Noorvitry**

Sertraline on Obsessive Compulsive Disorders in Indonesia  
(A Case Study)  
**Muhammad Rais Faisal., Hafid Algristian., Nur Azizah.**

House Dust Mite Exposure: Can It Be A Severe COVID-19  
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The Effect of Virtual Learning on Medical Student  
Professionalism: A Systematic Literature Review  
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Aidilfi Akbar.**

**I I M J** VOLUME 4 | NUMBER 1 | PAGE 1-50 | DEC 2022

PRINT  
ISSN 2176-2370  
ONLINE  
ESSN 2616-2389

Address: Jl. Raya Jemursari No. 67 Surabaya, East Java  
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## Profile of Neonates Born to Mothers With COVID-19 at RSUD Haji in East Java

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DOI : 10.33086/iimj.v4i1.3692

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### ARTICLE INFO

#### Keywords:

Neonates Born,  
Mother with  
COVID-19,  
COVID-19.

Submitted:

December 15<sup>th</sup>  
2022

Reviewed:

December 30<sup>th</sup>  
2022

Accepted: January  
16<sup>th</sup> 2023

### ABSTRACT

**Background:** COVID-19 infection can attack all levels of society, including pregnant women, which can impact the babies they give birth to and can increase morbidity & mortality in babies.

**Objective :** This study was conducted descriptively & retrospectively. All the data were collected from inpatient medical records of patients in the COVID-19 neonatal isolation room at RSUD Haji Surabaya from January 1, 2021 - December 31, 2021.

**Methods:** This study is retrospective and descriptive. The total population is all babies treated in the COVID-19 neonatal isolation room at the RSUD Haji Surabaya from January 1, 2021 – December 31, 2021. Data for all babies were obtained from medical records. Furthermore, the babies are grouped based on the way of birth. Furthermore, the baby's condition is broken down according to the required indicators.

**Results:** Most of the babies of mothers with COVID-19 were born at full term spontaneously. Only three babies were born with severe asphyxia and needed CPR resuscitation and the help of CPAP or neopuff breathing apparatus. Only 4 of the 15 babies with positive PCR results.

**Conclusion:** The vertical transmission of COVID-19 infection from pregnant women to their babies during the intrauterine period is still unclear because not all of these babies were confirmed for COVID-19 (the PCR results for these babies were only four positive). So further research is needed with larger samples and involving flashlights and other sectors related to COVID-19.

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### Introduction

COVID-19 infection can attack all levels of society, including pregnant women. This can have an impact during pregnancy and also on the babies they give birth to (Joma, 2021). These impacts include babies born prematurely, LBW (low birth weight

babies), experiencing emergencies in neonates, and even abortion and IUFD (Intra Uterine Fetal Death). However it is not clear yet how COVID-19 mothers affect the psychological status of newborns (Yang et., al. 2020). Although from several studies in China and several other countries, the

incidence rate is relatively low. Most of the babies of mothers with COVID-19 are born normally—or no problems. However, studies evaluating the potential for vertical or postnatal transmission of SARS-CoV-2 are still very few, have small sample sizes, and mainly originate from China, so the results may not show evidence of vertical transmission (Erika, 2021). Several other studies have described newborns with SARS-CoV-2 detected through nasal PCR tests and mild respiratory illness or pneumonia that can heal independently (Chen in Erika et. al., 2021). A study evaluating the initial 2-week period of SARS-CoV-2 infection in pregnant women showed no evidence of vertical transmission after delivery (Breslin, 2019.)

That is the aim of this research to determine whether the incident at RSUD Haji is the same as what happened elsewhere.

## **Methods**

This study is retrospective and descriptive. The total population is all babies treated in the COVID-19 neonatal isolation room at the (Rumah Sakit Umum) RSUD Haji in Surabaya from January 1, 2021 – December 31, 2021. Data for all babies were obtained from medical records. Furthermore, the babies are grouped based on the way of birth. Furthermore, the baby's

condition is broken down according to the required indicators.

## **Result and Discussion**

During this period, there were 15 babies treated in the COVID-19 Neonatal Isolation Room at RSUD Haji Surabaya. With the following details :

- a. 6 babies were born spontaneously (40%), 5 babies were born SC (33%), 1 baby was born spontaneously Bracht, 1 baby was born with manual aid at RSUD Haji, and the rest were referred from outside RSUD Haji.
- b. 7 babies were born with clear amniotic fluid (46.6%) & the rest were born with cloudy/ meconal green amniotic fluid.
- c. 7 babies born at term (full month) & 8 babies born prematurely (53.3%).
- d. 9 babies born with LBW (60%) & 6 babies born with LBW (40%).
- e. 4 babies were born with asphyxia (26.6%), 3 babies with severe asphyxia (20%), and 1 baby with moderate asphyxia.
- f. 3 babies got cardiopulmonary resuscitation (26.6%).
- g. 4 infants (26.6%) required CPAP assistance (1 with Neopuff), 1 infant with O2 nasal cannula.
- h. 5 hypothermic babies (33.3%).
- i. 4 babies experienced hypoglycemia (26.6%).

- j. 2 babies with RDS (13.3%) & 6 (40%) babies with pneumonia.
- k. 2 babies had feeding problems (13.3%).
- l. 1 baby had diarrhea, 2 babies with dehydration (13.3%).
- m. 1 (6%) baby had neonatal tetanus (referral from another hospital).
- n. 1 baby received a blood transfusion (6%).
- o. 6 infants had hyperbilirubinemia (40%).
- p. 4 babies with positive COVID-19 PCR, 6 babies with negative COVID-19 PCR, 1 baby with negative COVID-19 Ag swab, 1 baby with Reactive IgG COVID-19 Rapid test & 1 baby with Non-Reactive IgG COVID-19 Rapid test.
- q. 7 pregnant women (baby mothers) with confirmed COVID-19 & 7 baby mothers with probable COVID-19, 1 baby mother with no data.

From the results above, we know that not all babies born to mothers with COVID-19 during pregnancy are at high risk. Not all babies need LBW, premature or asphyxia, and require resuscitation. Three babies experience severe asphyxia & 3 babies need CPR resuscitation. Not all babies born to mothers with COVID-19 contracted intrauterine/vertical COVID-19 from their mothers. Only 4 out of 15 babies born to mothers with COVID-19 confirmed COVID-19 (26%).

However, due to the limited facilities available, the number of samples was

limited, and the COVID-19 case—even now was still relatively new. Under research development, we still needed more samples & longer time to be able to conclusions so that they could be used as references in society.

### Conclusion

Among several risk factors for LBW that showed significant results in this study were gestational age below 37 weeks, anemia, preeclampsia and PROM. The results of this study can be used as information material to determine the risk factors for the prevalence of LBW.

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## Sertraline on Obsessive Compulsive Disorders in Indonesia (A Case Study)

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DOI : 10.33086/iimj.v4i1.3602

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### ARTICLE INFO

Keywords:  
Sertraline,  
Obsessive-  
Compulsive  
Disorder.

Submitted:  
November 22<sup>th</sup>  
2022

Reviewed:  
February 2<sup>nd</sup> 2023

Accepted:  
February 9<sup>th</sup> 2023

### ABSTRACT

**Background:** Obsessive-compulsive disorder (OCD) was originally believed to be a rare mental illness. However, recent surveys and research have shown that OCD is one of the most common mental disorders. Research in India showed that the treatment of OCD using SSRIs (selective serotonin reuptake inhibitors) is preferred over the tricyclic group. This paper will discuss sertraline as the alternative to clomipramine for OCD.

**Objective:** Clomipramine as the treatment of choice for OCD is no longer included in the Indonesian MIMS index. Recent research suggests sertraline is preferred over clomipramine, and this paper discusses the efficacy of sertraline through a case study.

**Methods:** This study is a retrospective descriptive study on the case of 21-year-old male met the ICD-X criteria of OCD for having unwanted thoughts and repetitive behavior for locking the door and orderly compiling the books. The symptoms developed since he graduated from high school (three years before admission) and got worse since the last year. Sertraline was prescribed in the first place. The patient was routinely monitored during each visit for the next three months.

**Results:** The symptoms improved significantly after routinely taking sertraline for two months. The adverse effects were well-tolerated, such as nausea, headaches, and tachycardia. Psychotherapy was needed to modify the patient's obsession and to anticipate the risk of personality disorder should be noticed because the disorder appeared at a young age.

**Conclusion:** Sertraline as well as psychotherapy are worthy of consideration as first-line OCD therapy in Indonesia.

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### Introduction

Obsessive-compulsive disorder (OCD) was originally believed to be a rare mental illness. However, recent surveys and research have shown that OCD is one of the most common mental disorders (Sassano-Higgins & Pato, 2015). The study's results

by Klenfeldt *et al.* (2014) stated that the prevalence of OCD in the elderly aged 70 years was more experienced by women than men (Klenfeldt *et al.*, 2014). The study of Geller *et al.* (2021) reported an early onset of OCD on average at 9-10 years of age and a second onset often occurring at age 20



years. The comparison of incidence by sex of women and men in productive age is the same (Moulding *et al.*, 2016).

One of the pharmacological treatments for OCD is the tricyclic antidepressant drug, namely clomipramine (Pittenger & Bloch, 2014). Clomipramine exerts an antidepressant effect by inhibiting the reuptake of serotonin in the brain neurotransmitter (Moraczewski & Aedma, 2022). The least common side effects of clomipramine are dry mouth, weight gain, and sedation. In excess doses, it can cause seizures and even cardiotoxicity, so many clinicians limit the use of this drug for these considerations (Pittenger, 2017; Pittenger & Bloch, 2014).

Clomipramine is believed to be more efficacious but this drug is no longer used in Indonesia (Rizal & Fiana, 2021; Vildayanti *et al.*, 2018). Clomipramine is no longer circulating in the Indonesian drug market and is not included in the Indonesian MIMS index (Pascual *et al.*, 2022). Referring to this, other alternatives are needed that have equivalent efficacy, work affinity, and milder side effects. Research by Reddy *et al.* (2017) in India showed that the treatment of OCD using SSRIs (selective serotonin reuptake inhibitors) is preferred over the tricyclic group. This paper will discuss sertraline as the alternative to clomipramine for OCD.

## Objective

Clomipramine as the treatment of choice for OCD is no longer included in the Indonesian MIMS index. Recent research suggests sertraline is preferred over clomipramine, and this paper discusses the efficacy of sertraline through a case study.

## Method

This study is a retrospective descriptive study on the case of 21-year-old male met the ICD-X criteria of OCD for having unwanted thoughts and repetitive behavior for locking the door and orderly compiling the books. The symptoms developed since he graduated from high school (three years before admission) and got worse since the last year. Sertraline was prescribed in the first place. The patient was routinely monitored during each visit for the next three months.

## Case Study

Mr. R is a 21-year-old man with complaints of doing repetitive activities. The patient said he was tired because he often thought about and did repetitive activities for about three months before going to a psychiatrist. For example, whether he had closed and locked the door of the house even though it had just been closed and locked, or whether the engine had been heated in the morning even though he had done it before taking a shower in the

morning. Even when compiling books, he is often unsure whether they are neat and whether the order is aligned according to shape. So he had to do the things he thought he was not sure about earlier to make him sure and relieved. If he did not do it, he would be in so much pain and discomfort to think about it. In this case, an obsession is disturbed by unwanted thoughts. While preoccupation is not visible, the mind is fixated on an idea so that it only tells a story repeatedly.

Two years after graduating from high school, he decided to work. In between breaks, he played online games, often going home. He said he was afraid of losing while playing so he often repeated the game. In addition, if he replies to a text message, he is afraid that the message's content is incorrect. It will be read over and over again ten times, and he is unsure whether it has been sent, so he sends the same message repeatedly. He once tried to ignore it but became more worried and worried. He could not do anything all day, so he was more relieved he had to do it repeatedly. Sometimes he could handle it but later was very disturbed because his time was wasted. He tried to eliminate or divert these thoughts but was unable to, locked himself in his room, had trouble sleeping until he cried, and had thoughts of suicide.

Since this disorder emerged from a young age, we have been aware of the

presence of anankastic personality disorder and the possible risk of mood-psychotic disorders. During the examination, there was no impulsivity and uncontrollable anger as markers of anankastic personality disorder. There were no thought process disturbances such as excessive suspicion and paranoia that might be associated with the psychotic symptoms. OCD comorbidities and mood disorders such as depression are often accompanied by great distress due to the inability to focus due to obsession so the patient's quality of life decreases drastically (Jones *et al.*, 2018). From these findings, we believe that most of the distress and depressive symptoms that patients experience today are more related to his OCD.

This case was managed with sertraline 50 mg as an SSRI antidepressant drug. At first, sertraline was taken in the morning, but the patient felt sleepy when the drug started to work. We suggested taking sertraline in the afternoon or evening of the second week. The patient felt nauseous and tachycardic so his sleeplessness symptoms worsened and caused him to have a headache. These symptoms may be one of the side effects of sertraline. But after four hours, the patient could sleep well until morning. Total night's sleep is about 5-6 hours. In the morning, the patient still felt sleepy but the repetitive thoughts and behaviors were much reduced.

We added a benzodiazepine (clobazam 10 mg) at night to help relieve these side effects and asked him to go to bed earlier (below 10 pm), so he wouldn't be too sleepy in the morning. After one month, the complaints of these side effects improved, as did the OCD symptoms. The patient has regularly visited months later. After undergoing treatment for two months, the patient said his symptoms had improved. The patient regularly takes sertraline to reduce his symptoms, feels a little calmer in his mind, and his daily activities are improving; even though the patient is not completely able to fight his obsession, he can relax more in thinking, and sleep at night has improved. The dose was maintained as well since the first place, and scheduled for tapering off if the symptoms were significantly stable in a year.

## Discussion

According to ICD-X the criteria for OCD include obsessive symptoms or/and compulsive actions that must be present almost every day for two weeks or more and interfere with activities (Maslim, 2013). In contrast, obsessive symptoms include conscious thoughts, thoughts or actions that cannot be resisted, feelings of relief from anxiety after acting, and unpleasant repetition. The diagnosis is made if there is no depressive disorder at the time of obsessive-compulsive symptoms. This case

belongs to F42.2 Mixed Obsessive Thoughts and Actions. The patient exhibits obsessive thoughts and compulsive acts that are equally prominent. Following the ICD-X criteria, this case has occurred for approximately three months. The patient realizes the action of closing the door, compiling books, or heating the motor engine cannot be ignored. It is more relieving if the procedure is repeated, but the patient feels disturbed, wasting his time.

Pharmacotherapy in patients with OCD is given antidepressants (Fineberg *et al.*, 2012). In the 1980s, the first antidepressant drug recommended by the FDA was clomipramine from the tricyclic group (Wilson & Tripp, 2022). However, many reports of side effects limit the use of Clomipramine (Brock & Hany, 2022; Casale *et al.*, 2019). To look for other alternatives, clinical trials are continuing. The SSRI class proved useful in patients with OCD in 1989 (Pittenger & Bloch, 2014). More than 20 clinical trials have determined that SSRIs work equivalent to or better with minimal side effects (Goodman *et al.*, 2014).

The SSRI group is fluoxetine, citalopram, escitalopram, paroxetine, sertraline, and fluvoxamine (Edinoff *et al.*, 2021). In this case study, sertraline was given as the first line to relieve symptoms (Nezgovorova *et al.*, 2022). This is in line with Soomro (2012) research which states

that sertraline significantly relieves symptoms compared to clomipramine. Sertraline works by inhibiting the reuptake of neurotransmitters released from presynaptic neurons to the synaptic cleft, which is selective only on serotonin so that it can relieve depressive symptoms associated with OCD (Boland *et al.*, 2022; Elvira & Hadisukanto, 2018; Perez, 2021). Sertraline is widely circulated in Indonesia and is better tolerated than tricyclic antidepressants. Possible side effects include nausea, dizziness, sweating, drowsiness, and sexual disturbances (Syamsuddin *et al.*, 2022).

The appropriate psychotherapy for this patient is supportive psychotherapy and cognitive-behavioral psychotherapy (CBT) (Elvira & Hadisukanto, 2018) (Stein *et al.*, 2019). Supportive psychotherapy is the second therapy after pharmacotherapy which aims to reduce symptoms, reduce anxiety, and increase self-esteem by encouraging positive transference and the use of mature and adaptive defense mechanisms (Grover *et al.*, 2020) (Markowitz, 2014). The psychotherapeutic approach can be made with guidance techniques, tension control, environmental manipulation, externalization of attention, reassurance, suggestion, persuasion, pressure, and coercion, as well as recognition and ventilation (Elvira & Hadisukanto, 2018) (Grover *et al.*, 2020).

CBT is a psychotherapy that focuses on correcting cognitive deviations due to events that harm him both physically and psychologically (Yahya & Megalia, 2017). The initiation of CBT in patients with OCD goes through several stages. First, is psychoeducation, in which patients are educated about coping strategies, letting go and avoiding, exposure therapy, and developing a fear hierarchy. Involve family members, considering the challenges family members face in changing the patient's daily routine. Second, motivation is to help patients reduce anxiety about their treatment to minimize the burden for patients and families (Al-Sharbati *et al.*, 2014). Various studies of CBT conducted on patients with OCD it has shown significant improvement in symptoms in both adults and children (Stein *et al.*, 2019).

## Conclusion

This study is limited to one case and can be used as an example of the use of sertraline for OCD, although caution is necessary for making generalizations. Given that clomipramine has high side effects and is not available in the Indonesian drug market, many clinicians switch to the SSRI group, one of which is sertraline, which is widely circulated in Indonesia. SSRIs have long been the first choice in the treatment of OCD. Sertraline has a better drug effect with fewer side effects.

Psychotherapy such as CBT and other supportive psychotherapy are also needed to improve the patients with OCD quality of life. One of the important things to note from this case is the risk of personality disorders because the disorder appeared at a young age. Further research is needed regarding the comorbidity of OCD with other personality disorders.

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## House Dust Mite Exposure: Can It Be A Severe COVID-19 Prevention?

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DOI : 10.33086/iimj.v4i1.3817

### ARTICLE INFO

Keywords:  
House dust mite,  
COVID-19,  
eosinophil,  
prevention,  
corona virus.

Submitted:  
January 17<sup>th</sup> 2023  
Reviewed:  
February 1<sup>st</sup> 2023  
Accepted:  
February 9<sup>th</sup> 2023

### ABSTRACT

**Background:** In the midst of the ongoing COVID-19 pandemic, many studies are looking for treatment to suppress viral replication and prevention through vaccination. However, to this day the number of incidences and deaths due to COVID-19 is still increasing.  
**Objective:** The purpose of this article is to review theoretically the alleged increase in eosinophils in house dust mite exposure can prevent the severity of COVID-19 symptoms.

**Methods:** This article was compiled through a literature search in reputable international journals by the time 2020-2021.

**Result:** The severity of symptoms that arise due to COVID-19 infection is one of them caused by eosinophilia. On the other hand, the host immune response to house dust mite exposure can increase the number of eosinophils through stimulation of IL-6, IL-8, GM-CSF, IL-5 and IL-33. These eosinophils will then express TLR-7 on the cell surface which makes them able to recognize SARS-CoV-2. Stimulation of this eosinophil receptor triggers the production of cytokines, degranulation, superoxide, and nitric oxide (NO) through NO synthase which has a direct antiviral effect. EDN and ECP of human eosinophils can decrease viral infectivity through a ribonuclease-dependent mechanism. Eosinophils are capable of producing extracellular traps composed of eosinophilic granule proteins bound to mitochondrial DNA in response to viral infection in vitro, especially in an oxidative lung tissue environment. Eosinophils also rapidly mobilize granules of Th1 cytokines, including IL-12 and IFN- $\gamma$  which are important for antiviral immune responses.

**Conclusion:** Although available data are still limited, there are indications that eosinophils have a protective effect during SARS-CoV-2 infection. Therefore, biological agents such as exposure to house dust mites targeting eosinophils may be useful to help clarify the role of eosinophils in their antiviral response.

### Introduction

The rapid spread of COVID-19 poses a serious threat to public health. This prompted researchers to explore the pathogenic characteristics of the SARS-CoV-2 virus in order to develop effective

drugs. (Seyed et al, 2020) However, to this day the incidence and death rates due to COVID-19 are still increasing. From 224 countries around the world, there are more than 220 million confirmed positive COVID-19 patients with more than 4

million of them dying. (Jee Y et al, 2020) In Indonesia, there are more than 4 million COVID-19 sufferers with 136,000 deaths. (Van Empel et al, 2020)

There are several predictors of the severity of COVID-19 symptoms, including age >55 years, multiple comorbidities, hypoxia, biomarkers of organ dysfunction, and laboratory test abnormalities, including a decrease in the eosinophil count below the normal range ( $<0.02 \times 10^9/L$ ). (Gallo et al, 2021) The response of eosinophils during COVID-19 infection has been reviewed previously. (Lindsley et al, 2020) So far, the role of eosinophils in the mucosal immune response of the respiratory tract has often been focused on their adverse effects which are considered to have potent proinflammatory functions. In fact, research shows that eosinophils have a molecular device that allows them to recognize and respond to respiratory viruses. (Flores et al, 2019)

Questions from several reviews have led to the extent to which the role of eosinophils is suggested for the prevention of severe COVID-19. For example, will patients with eosinophilia-related diseases be immune to COVID-19? Do patients with eosinophilia have typical COVID-19 disease manifestations? This question is considered relevant because eosinophilia has been reported in patients with acute impairment of respiratory function during SARS-CoV-2 infection. (Zhang et al, 2020) Do eosinophils have an impact on lung pathology induced during COVID-19? Indeed, pulmonary pathology associated with eosinophils is known to occur following certain viral infections, such as respiratory syncytial virus (RSV). (Lindsley et al, 2020)

On the other hand, the host immune response to exposure to house dust mites can increase the number of eosinophils through stimulation of proinflammatory cytokines. (Abu et al, 2020) The purpose of this article is to review theoretically the alleged increase in eosinophils in house dust mite exposure can prevent the severity of COVID-19 symptoms.

### **Increased Eosinophils in House Dust Mite Exposure**

Der p 1 is a cysteine protease as the main allergen of house dust mites. In addition to being an antigen, Der p1 can also activate protease-sensitive receptors (PARs) and TLR4 or trigger cell injury in epithelial cells. This activates the NLRP3 inflammasome and secretes cytokines and chemokines that recruit myeloid cells including dendritic cells, eosinophils, and ILC2. (Abu et al, 2020)

Activation of pattern-recognition receptors (PRRs) in the epithelium by allergens or via contaminant pathogen-associated molecular patterns (PAMPs) represents one of the core steps in Th2-mediated sensitization that will result in the release of proinflammatory cytokines and chemokines, thereby amplifying the entry of eosinophils, Th2 cells, basophils, dendritic cells, and other inflammatory cells. (Proud et al, 2011) Furthermore, the released cytokines activate innate immune cells such as eosinophils, mast cells, group 2 innate lymphoid cells (ILC2), and basophils to maintain the inflammation mediated Th2. (Spits et al, 2012)

A study conducted by Cunningham et al. showed that exposure to activated papain can increase IgE and IgG1 antibody responses thereby triggering eosinophilia, IL-4, IL-5, and IL-10 in broncho alveolar



lavage (BAL) from mice. (Cunningham et al, 2012)

House dust mite allergen-mediated activation of PARs will trigger the release of pro-Th2 cytokines and chemokines including IL-6, GM-CSF, and IL-8 in cultured airway epithelial cells. These cytokines and chemokines trigger extravasation and accumulation of eosinophils, neutrophils, and basophils. (Kauffman et al, 2006) In addition, lipopolysaccharides (LPS) from bacteria that contaminate house dust mites can also trigger Th2 responses and eosinophilic inflammation when Th1 responses and neutrophilic inflammation occur. (Eisenbarth et al, 2002)

Der p2 sensitization induces Th2-mediated inflammation through airway eosinophilia, lymphocytosis, mucus metaplasia, and elevated plasma IgE concentrations in mice (Trompette et al, 2009)

Recent studies have shown that the NLRP3 complex modulates house dust mite-induced inflammation by controlling the influx of eosinophils, Th2 cytokines and chemokines in the mouse airway. Therefore, NLRP3 mice trigger an increase in airway inflammation in response to HDM which is associated with infiltration of immune cells, especially eosinophils, Th2 cytokines and chemokines in their airways. This study demonstrated that mice lacking caspase-1 due to house dust mite exposure trigger eosinophilia and increased cytokines IL-25, TSLP, and IL-33. (Madouri et al, 2015) Decreased inflammation is associated with less leukocyte infiltration into the lung, especially eosinophils. (Zaslona et al, 2020)

The relevance of the C-lectin receptor to house dust mite-mediated allergy is

reinforced by evidence that dectin-1 is important for the development of eosinophil and neutrophil influx into the lung, as well as attracting Th2 cytokines. (Barrett et al, 2011) Stimulation of dectin-1 or mannose receptors by chitin will mediate polarization. Th1, Th2, and Th17 thus recruiting basophils and eosinophils. (Lee et al, 2011)

### **Eosinophil Response in COVID-19**

Human eosinophils express several Toll-like receptors (TLRs), including TLR3, TLR7, and TLR9 which can detect virus-associated molecular patterns. (Mansson et al, 2010) TLR7 enables eosinophils to recognize single-stranded RNA viruses such as coronaviruses and stimulation of these receptors in human eosinophils trigger the production of eosinophil cytokines, degranulation, generation of nitric oxide (NO) and superoxide, and prolong cellular resistance. (Nagase et al, 2003) Eosinophil cationic protein (ECP/RNase3) and eosinophil-derived neurotoxin (EDN/RNase2) from human eosinophils reduce viral infectivity via a ribonuclease-dependent mechanism. (Domachowske et al, 1998) Both human and mouse eosinophils produce NO via an inducible NO synthase, which has direct antiviral effects against several viruses. (Drake et al, 2016) Eosinophils are capable of producing extracellular traps composed of eosinophilic granule proteins bound to genomic DNA and mitochondria. In addition, mouse eosinophils can release this DNA trap in response to viral infection in vitro, (Silveira et al, 2019) particularly in an oxidative lung tissue environment. (Yousefi et al, 2018) Eosinophils can also rapidly mobilize newly formed granules of Th1 cytokines, including IFN-gamma and IL-

12, which is important for antiviral immune responses.(Davoine et al, 2014) In the mouse model, pulmonary eosinophils upregulate CD86 and MHC-1 in response to viral infection, both of which can directly interact with CD8 T cells and promote T cell recruitment. Virus-specific CD8 into the lungs to enhance antiviral immunity. (Samarasinghe et al, 2017) Activated mouse and human eosinophils also express MHC-II molecules and costimulatory molecules, and can function as antigen-presenting cells for viral antigens, leading to T cell activation, and cytokine secretion.(Del Pozo et al, 1992)

IL-5 transgenic mice that constitutively overproduce IL-5 and possess eosinophils have accelerated viral clearance during infection. In contrast, mice genetically engineered to be eosinophil-deficient had lower viral clearance than controls. (Phipps et al, 2007) Adoptive transfer of eosinophils from *Aspergillus fumigatus* antigen-sensitized mice into the respiratory tract of virus-infected mice decreased virus titers and increased CD8 T cells. (Samarasinghe et al, 2017) Interestingly, human subjects with asthma who were treated with the antieosinophil drug mepolizumab (an anti-IL-5 humanized mAb) or placebo and consecutively exposed to the virus showed that patients treated with mepolizumab results in a significant increase in viral titers in the upper respiratory tract. This supports the antiviral role of eosinophils. (Sabogal et al, 2019) The growth of biologic agents targeting eosinophils may be useful to clarify the role of eosinophils having different antiviral roles. Although preclinical studies have demonstrated the antiviral activity of eosinophils, their clinical relevance in the immune response

to different respiratory viruses requires further investigation. (Lindsley et al, 2020)

Influenza, RSV, and rhinovirus are common triggers of virus-induced asthma exacerbations, while coronaviruses are less likely to trigger acute asthma exacerbations. (Edwards et al, 2017) Asthma has been identified as not a major risk factor for the severity of SARS-CoV-1 infection. (Yin et al, 2018) In line with SARS-CoV-2, the study by Zhang et al(2020) reported that none of the 140 patients hospitalized positive for COVID-19 in China had asthma or atopic comorbid disease. Another recent review of 548 patients treated for COVID-19 in hospitals in Wuhan only reported an asthma prevalence of 0.9%, i.e. only 5 cases, which is lower than the prevalence of asthma in the adult population in Wuhan (6.4%). Leukocytosis, with an elevated absolute neutrophil count, is associated with severe COVID-19 manifestations. (Li X, 2020)

Interestingly, Zhang et al reported that more than half of patients with COVID-19 (53%) had eosinophilia (defined as an absolute eosinophil count  $< 0.02 \times 10^9$  cells/liter) at the time of admission. (Zhang et al, 2020) So did Du et al (2020). who reviewed the medical records of 85 fatal COVID-19 cases and noted that 81% of patients had an absolute eosinophil count below the normal range at the time of hospital admission. Lymphopenia is also a common finding in COVID-19 patients and blood eosinophil counts are positively correlated with lymphocyte counts in both severe and mild cases.(Zhang et al, 2020) Liu et al(2020) also noted the incidence of eosinophilia at the start of a cohort study of patients treated with lopinavir. Eosinophil levels improved in all patients shortly before being discharged. This suggests that

the resolution of eosinopenia can be an indicator of improved clinical status. The pathophysiology for eosinophilia in COVID-19 remains unclear, but appears to be multifactorial, involving inhibition of eosinophil egress from the bone marrow, blockade eosinophilopoiesis, decrease expression of chemokine receptors or adhesion factors, (Hassani et al, 2020) and/or induce eosinophil apoptosis directly via the release of type 1 IFNs during acute infection. (Butterfield et al, 2007)

No increase in eosinophils in lung tissue was observed from samples of patients with COVID-19 in the early stages of the disease (37) or on postmortem analysis (Barton et al, 2020). Although current data are limited, there is little indication that eosinophils have a protective role during SARS-CoV-2 infection. However, eosinopenia may act as a prognostic indicator for severe COVID-19. (Lindsley et al, 2020)

## Conclusion

Although available data are still limited, there are indications that eosinophils have a protective effect during SARS-CoV-2 infection. Therefore, biological agents such as exposure to house dust mites targeting eosinophils may be useful to help clarify the role of eosinophils in their antiviral response.

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## Drug Interactions in Coronary Heart Disease Patients : A Literature Review

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DOI : 10.33086/iimj.v4i1.3856

### ARTICLE INFO

Keywords:  
Drug interactions,  
coronary heart  
disease

Submitted:  
February 2<sup>nd</sup> 2023  
Reviewed:  
February 4<sup>th</sup> 2023  
Accepted:  
February 15<sup>th</sup>  
2023

### ABSTRACT

**Background:** Patients with coronary heart disease generally receive many drugs, such as hypercholesterolemia, antianginal, antiplatelet, anticoagulants, and medications for comorbid illnesses such as antihypertension and diabetes mellitus. Concomitant administration of several types of drugs may result in drug interactions.

**Objective:** This study aims to figure out drug interactions that might occur in using combination drugs in patients with coronary heart disease.

**Methods:** This article review uses the Google Scholar database, published 2017-2022. The keywords used were "coronary heart disease and drug interactions." The PRISMA flowchart is used to summarize the article selection process.

**Results:** Administration of aspirin with clopidogrel causes a moderate synergistic interaction, whereas administration of antiplatelet agents with anticoagulants causes a significant synergistic interaction on bleeding. And the administration of nifedipine with atorvastatin causes a synergistic pharmacodynamic interaction.

**Conclusions:** Drug interactions occur in patients with coronary heart disease, either synergistic or antagonistic pharmacodynamic interactions with minor, moderate, and significant classifications.

### Introduction

Cardiovascular disease is the leading cause of death worldwide, according to WHO. However, coronary heart disease (CHD) accounts for 31.9% of deaths in Indonesia. Coronary heart disease begins with endothelial dysfunction, which causes LDL cholesterol to be in the subendothelial layer, then it will be phagocytized by monocytes to form foam cells. If broken, foam cells have a fibrous shield that

will trigger platelet aggregation. This aggregation will clog the coronary arteries. Total blockage of the coronary arteries will result in a sudden heart attack and can end in death if not treated immediately (Wahidah dan Harahap RA. 2021).

Patients with coronary heart disease generally receive many types of drugs, such as hypercholesterolemia and antianginal drugs, drugs that may be given from anti-hypercholesterolemia, namely

atorvastatin, rosuvastatin, simvastatin, while for anti-angina medications such as nitrates, beta-blockers, and calcium channel blockers, antiplatelets such as aspirin, clopidogrel or ticagrelor, anticoagulants such as fondaparinux, enoxaparin or heparin. In addition, patients usually also receive drugs for comorbid diseases such as hypertension and diabetes mellitus drugs. Administering several types of drugs together may result in drug interactions (PERKI. 2018). Therefore, based on the problems above, it is necessary to analyze drug interactions that might occur in using combination drugs in patients with coronary heart disease.

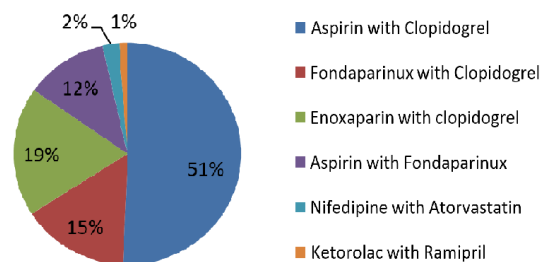
**Methods**

This article review uses the Google Scholar database, published 2017-2022. The keywords used were "coronary heart disease and drug interactions." The PRISMA flowchart is used to summarize the article selection process.

**Results and Discussion**

The results of the review article found that the most synergistic drug interactions for coronary heart disease occurred in the co-administration of aspirin with clopidogrel in 43 patients (51%), followed by the administration of enoxaparin with clopidogrel (Figure 1).

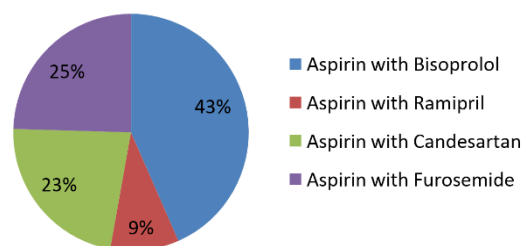
**SYNERGIC DRUG INTERACTIONS**



**Figure 1. Synergistic Drug Interactions for Coronary Heart Disease**

Meanwhile, antagonistic interactions with coronary heart disease drugs occurred in the administration of aspirin and bisoprolol in 23 patients (43%), followed by the administration of aspirin with furoseamide (Figure 2).

**ANTAGONIST DRUG INTERACTIONS**



**Figure 2. Coronary Heart Disease Antagonist Drug Interactions**

Synergistic interactions that increase the occurrence of bleeding occur a lot in the administration of aspirin with clopidogrel, an antiplatelet group, followed by the administration of enoxaparin with clopidogrel, fondaparinux with clopidogrel and fondaparinux with aspirin which is an anticoagulant and antiplatelet group (Table 1).

**Table 1. Literature Review Results**

No	Article Title	Source	Source	Result	Conclusion
1	Gambaran interaksi obat penyakit jantung koroner dengan sindrom metabolik pada pasien rawat jalan di RS TK II DR. Soepraoen Malang	Google scholar	Descriptive study, with retrospective observation, Extraction of data from medical records, the population of all outpatient coronary heart disease medical record data at the Cardiac Polyclinic of RS Tk II dr. Soepraoen Malang. Purposive sampling was used to collect samples that met the inclusion criteria. Eighty-nine patients constituted the entire sample.	The results showed that 22 patients who were given the combination of aspirin + bisoprolol experienced minor classification antagonist pharmacodynamic interactions, three patients who were given the variety of aspirin + ramipril drugs experienced moderate classification antagonist pharmacodynamic interactions, 12 patients who were given the combination of aspirin + candesartan drugs experienced classified antagonist pharmacodynamic interactions moderate and ten patients who were given the variety of aspirin + clopidogrel drugs experienced a moderate classification of synergistic pharmacodynamic interactions.	The interaction of aspirin-bisoprolol, categorized as a minor antagonist pharmacodynamic interaction, is the most common drug interaction. The aspirincandesartan interaction, which is classified as a moderate antagonistic pharmacodynamic interaction, is the next most common drug interaction.
2	Kajian interaksi obat aktual pada pasien jantung koroner di Rumah Sakit X Kota Tasikmalaya	Google scholar, Jurnal farmasi Muhammadiyah Kuningan	The study design was cross-sectional, and prospective data collection was used. According to the 2009 Drug Interaction Facts Tatro, literature studies with significant, moderate, or minor severity levels are used for drug interaction analysis. One hundred patients met the inclusion criteria for the study.	The results showed that three patients who were given the combination of aspirin + clopidogrel drugs experienced a significant synergistic pharmacodynamic interaction, one patient who was given the variety of Fondaparinux + Clopidogrel drugs experienced a synergistic pharmacodynamic interaction, one patient who was given the combination of drugs Ketorolac + Ramipril experienced a synergistic pharmacodynamic interaction and two patients who were given a variety of medications given a combination of drugs Aspirin + Ramipril experienced drug interactions.	The aspirin-clopidogrel interaction, categorized as a significant synergistic pharmacodynamic interaction, is the most common drug interaction.



3	Kajian Interaksi Obat Potensial Pada Pasien Penyakit Jantung Koroner Rawat Inap di RSUD Moewardi Tahun 2018	Google scholar, Urecol	This non-experimental study used medical record data from patients diagnosed with CHD who met the inclusion criteria retrospectively. A descriptive analysis was performed, and a purposive sampling strategy was used in this study. There were 100 patients who met the inclusion criteria for the study.	The results of the study showed that 16 patients who were given the drug combination Enoxaparin +clopidogrel experienced significant synergistic pharmacodynamic interactions, 12 patients who were given the drug combination clopidogrel +fondaparinux experienced meaningful synergistic pharmacodynamic interactions, ten patients who were given the drug combination aspirin+ fondaparinux experienced significant synergistic pharmacodynamic interactions, 30 patients who were given the combination of aspirin + clopidogrel experienced moderate synergistic pharmacodynamic interactions and 13 patients who were given the variety of aspirin + furosemide experienced minor antagonistic pharmacodynamic interactions.	The aspirin-clopidogrel interaction, categorized as a moderate synergistic pharmacodynamic interaction, is the most common drug interaction, followed by the enoxaparin-clopidogrel interaction, which is classified as a significant synergistic pharmacodynamic interaction..
4	Evaluasi interaksi obat jantung koroner pada pasien rawat inap di rumah sakit umum Imelda pekerja Indonesia Medan	Google scholar	Research-based on Descriptive observation. They utilized information from the medical records of CHD patients treated at RSUD Imelda. The population includes all CHD patient medical records from January to December 2020. Total sampling was used to select 71 people for the study sample.	The results showed that two patients who were given the combination of nifedipine + atorvastatin experienced moderate synergistic pharmacodynamic interactions, and one patient who was given the variety of drugs aspirin + bisoprolol experienced minor antagonistic pharmacodynamic interactions.	Nifedipine and atorvastatin have moderate synergistic pharmacodynamic interactions, making them the most common drug interactions

The results of the four journals studied, three of which reported that the concomitant administration of aspirin and clopidogrel resulted in moderate synergistic pharmacodynamic drug interactions, that is drug effects that mutually reinforce each other when given simultaneously. Although the combination of aspirin and clopidogrel increases the risk of bleeding, it also reduces the risk of ischemic complications, myocardial infarction, and acute attack mortality. Therefore, this drug combination is used in patients in critical condition with close monitoring (Rahmawati DU and Mutmainah N. 2021). If a bleeding side effect occurs due to the use of the two drugs, it can be prevented by pausing the administration of the two drugs.

Two of the four journals observed concurrent administration of anticoagulant drugs with antiplatelet drugs (fondaparinux+clopidogrel/fondaparinux+aspirin/enoxaparin+clopidogrel) led to significant synergistic pharmacodynamic interactions, meaning that if these two classes of drugs were given together, it would increase the occurrence of more substantial bleeding compared to double administration antiplatelet. Suppose the patient is in bad condition and must be given a combination of anticoagulants and antiplatelets. In that case, this can be done by reducing the dose of anticoagulants and

paying attention to the INR (PERKI, 2016). Clopidogrel and Fondaparinux interact with each other. It inhibits factor Xa through its specific activity. Fondaparinux binds to antithrombin and alters the formation of antithrombin reactive sites, activating factor Xa inhibition. After that, antithrombin is started by releasing fondaparinux so that bleeding occurs. (Robiyatul S. et al. 2021). In addition, the combination of NSAIDs can cause gastrointestinal bleeding if given together with Ramipril.

Two of the four journals that studied the administration of Aspirin and bisoprolol caused minor antagonist pharmacodynamic drug interactions. The interactions of these drugs can reduce the effect of bisoprolol in lowering blood pressure, and the interactions between drugs work on the receptor system. The exchange of Aspirin together with Ramipril will increase the antihypertensive effect so that acute hypotension can occur and decreased kidney function, this also appears in the administration of Aspirin with candesartan, so it is necessary to monitor the patient's blood pressure and kidney function (Aprilianti RG. et al. 2022: Robiyatul S. et al. 2021).

Administration of aspirin with Furosemide causes minor antagonistic pharmacodynamic interactions. The interaction mechanism is that aspirin can reduce the effects of loop diuretic drugs,

one of which is Furosemide, and the exchange of Nifedipine with Atorvastatin, Nifedipine will increase the impact of atorvastatin with hepatic/intestinal enzyme CYP3A4 metabolism.

Administration of aspirin with clopidogrel causes a moderate synergistic interaction, whereas administration of antiplatelet agents with anticoagulants causes a significant synergistic interaction on bleeding. And the administration of nifedipine with atorvastatin causes a synergistic pharmacodynamic interaction.

## Conclusion

Drug interactions occur in patients with coronary heart disease, either synergistic or antagonistic pharmacodynamic interactions with minor, moderate, and significant classifications.

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## The Use of Antibiotics Without a Prescription : A Literature Review

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DOI : 10.33086/iimj.v4i1.3855

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### ARTICLE INFO

Keywords:  
Antibiotics,  
behavior, society

Submitted:  
February 2<sup>nd</sup> 2023  
Reviewed:  
February 4<sup>th</sup> 2023  
Accepted:  
February 15<sup>th</sup>  
2023

### ABSTRACT

**Background:** Infectious diseases are treated with antibiotics. Antibiotics are widely used because infectious diseases are so common. Even though antibiotics are purchased at pharmacies with a doctor's prescription, many antibiotics are currently being taken without a prescription. Resistance will develop if antibiotics are consumed without a doctor's prescription and not according to indications for administration.

**Objective:** This study examines how people use antibiotics without a doctor's prescription.

**Methods:** The author of this article uses a method related to the article's title by using some relevant literature from database of journals such as Google Scholar. The discussion and findings of this study will assist readers and health professionals in analyzing how people use antibiotics without a prescription.

**Result:** Based on the findings of the five studies, journals discuss the relationship between knowledge level and attitudes regarding the use of antibiotics without a prescription. This literature review shows that most people of reproductive age consume antibiotics without a doctor's prescription to treat symptoms usually caused by non-bacterial pathogens.

**Conclusion:** One of the intervention approaches taken to restrict access is government control. Holistic interventions against those who sell antibiotics without a prescription are expected to significantly reduce the irresponsible use of antibiotics in the community.

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### Introduction

Many antibiotics work differently on bacteria, and antibiotics usually don't kill viruses directly. Antibiotics can be made from natural or synthetic components. Antibiotics are made by bacteria, which are eukaryotic organisms like plants, and are usually made to protect themselves from other bacteria and kill them (Lerner et al, 2003).

So far, taking antibiotics has been very good for you. Antibiotic treatment has a significant effect when prescribed and used correctly. The most common treatment for bacterial infections is antibiotics. However, there has been a shift in the use of antibiotics from year to year. It is not uncommon for individuals to misuse antibiotic treatment because of its immediate effect in treating infections.

Using antibiotics without a doctor's prescription is inappropriate (Abdullah, 2012). Antibiotics for viral coughs, colds, fevers, and acute diarrhea are often purchased over the counter by individuals who have previously received them without explanation (IAI, 2011).

The use of antibiotics without a doctor's prescription can pose potential dangers to users, such as increased antibiotic drug resistance followed by increased pathogenic bacterial infections, adverse drug reactions, decreased treatment efficacy, and increased healthcare costs. One of the most significant hazards that need to be monitored is the development of antibiotic-resistant microorganisms that cause infections. According to Kurniawati's research (2019) on residents of the Glagah sub-district, 73% of the population misuses antibiotics. Residents take antibiotics for pain, cough, and aches. Antibiotics can be purchased without a prescription or with a doctor's prescription for some residents. The majority of the population admits that taking antibiotics quickly improves their health.)

## Methods

Using a database of journals such as Google Scholar, a research strategy is carried out that is relevant to the topic "Antibiotics, behavior, and society," the keywords used. Studies that met the criteria

were selected through a review of journals and full-text articles. Five articles that meet the criteria can be found by searching using the keywords above. Afterward, the articles used as samples were identified and presented in the literature review table.

## Results and Discussion

The results of the study were obtained from five journals used in this literature review, discussing the factors and behavior of using antibiotics without a prescription. The five studies focused on discussing the use of antibiotics without a prescription. A summary of the five studies used is listed in Table 1.

Based on the research findings of Yarza et al. (2015) regarding the relationship between the level of knowledge and attitudes about using antibiotics without a prescription, it can be concluded that there is no significant effect. Relationship between level of knowledge and use of antibiotics without a prescription; Attitude and use of non-prescription antibiotics are significantly related; The use of antibiotics without a doctor's prescription has nothing to do with insurance ownership significantly.

Lingga et al. (2021) examined antibiotics used by people in the Banjar district area. Based on the findings, people use antibiotics for fever (61.90 percent), stop using antibiotics after recovery (77.78

percent), use antibiotics only as prescribed (68.25 percent), and give antibiotics to family members (52.38 percent). ), storing available antibiotics. According to Djawara et al. in 2018, the findings of this study regarding the analysis of behavior and factors that significantly contribute to the behavior of using antibiotics without a prescription in Surabaya can be used to determine the most effective intervention strategy to overcome the problem of using non-prescription antibiotics in pharmacy. Over-the-counter antibiotics should not be attributed solely to pharmacists, given the complexity of factors contributing to this behavior.

The findings of Nur Jumaisah Kurniawati's research (2019) regarding consumers' descriptions of antibiotics purchased without a doctor's prescription at Pharmacy X in the Probolinggo area show that consumers have an adequate level of knowledge.

According to Eka Dipta, Mutawalli Syahid Latief, and Nurul Farida (2022), Serang concluded that the results of his research showed that the level of public knowledge in using antibiotics showed poor

results; this was influenced by public knowledge of the level of use of antibiotics without a doctor's prescription. Based on the level of antibiotic use in the community, 53.75 percent of respondents used antibiotics prescribed by a doctor, while 46.25 percent used antibiotics without a prescription. Meanwhile, the demographics of respondents revealed that women accounted for 33.50% of non-prescription antibiotic users, and people between the ages of 20 and 35 used antibiotics the most. Private employees make up 21.75 percent of the respondents who take antibiotics without a prescription, and primary school graduates have the highest level of education (17.5%).

Based on the findings of the five studies, journals that discuss the relationship between knowledge level and attitudes regarding the use of antibiotics without a prescription (Hasnal Laily Yarza, Yanwirasti, and Lili Irawati, 2015) have a high chance of success if further research is carried out on the topic of using antibiotics without a doctor's prescription.

**Table 1. Literature Review Results**

No	Title	Design	Sample	Variable	Instrument	Analysis	Result
1	Hubungan tingkat pengetahuan dan sikap dengan penggunaan antibiotic tanpa resep Peneliti: Yarza H, dkk. (2015)	Simple Random sampling	152 people	Dependent: Level of knowledge and attitude Independent : Use of antibiotics without a prescription	Questionnaire	Analysis between variables using chi square with SPSS software	Antibiotics taken without a prescription have a significant relationship with attitudes and behavior. Attitudes significantly impact health behavior, as do some other individual factors, including knowledge, beliefs, and values.
2	Perilaku penggunaan antibiotik pada masyarakat di Wilayah kabupaten Banjar Peneliti: Lingga HN, dkk. (2021)	Descriptive method	400 people	Dependent: behavior Independent :Use of antibiotics	Interview about the use of antibiotics	data analysis of each patient's answer	Based on the research findings, it is known that public awareness of the use of antibiotics is still low (56 percent).
3	Analisa Perilaku dan faktor penyebab perilaku penggunaan antibiotic tanpa resep di Surabaya Peneliti : Djawara, dkk. (2018)	Cross-sectional design	128 people	Dependent: Behavior, causal factors independent: use of antibiotics without a prescription	Questionnaire	Factor analysis with orthogonal rotation	In Surabaya, most of the productive age population consumes antibiotics without a doctor's prescription to treat common symptoms caused by non-bacterial pathogens.
4	Gambaran penggunaan antibiotic tanpa resep dokter oleh konsumen di apotik X wilayah Probolinggo Peneliti: Nur Jumaisah kurniawati (2019)	descriptive with accidentl sampling	Apotik X in the Probolinggo area and will be held in April 2019	Independent : Use of antibiotics without a prescription	Questionnaire		As many as 75 respondents in this study used antibiotics without a doctor's prescription, and their knowledge of antibiotics was 56.94 percent which was in the moderate category
5	Pengaruh pengetahuan masyarakat terhadap tingkat penggunaan antibiotic tanpa resep dokter pada cipocok jaya, Serang Peneliti: Dipta, dkk. (2022)	Descriptive method	400 people	Dependent: Community knowledge Independent : The use of antibiotics without a prescription	Interview about the use of antibiotics	Frequency analysis of ten questions that measure a person's level of antibiotic knowledge is used to calculate data analysis, with one correct answer being worth one and zero being wrong	Based on the research findings, it is known that public awareness of the use of antibiotics is still low (56 percent).

## Conclusion

This literature review shows that most people of reproductive age consume antibiotics without a doctor's prescription to treat symptoms usually caused by non-bacterial pathogens. In this literature review, the ease of obtaining antibiotics from pharmacies is the most influential factor in people's decisions to buy antibiotics without a doctor's prescription. One of the intervention approaches anticipated to limit access to antibiotics without a doctor's prescription, which is so widespread in Indonesia, is government control in the form of tighter regulations. However, changes in the behavior of health workers are not accompanied by an assertive approach that involves making policies related to public access to purchasing antibiotics. In that case, the results will not be optimal. It is necessary to conduct additional research on the factors influencing pharmacists' actions in selling antibiotics without a doctor's prescription. Holistic interventions against those who sell antibiotics without a prescription are expected to reduce the irresponsible use of antibiotics in society significantly.

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## Competency of Muslim Doctors

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DOI : 10.33086/iimj.v4i1.2242

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### ARTICLE INFO

Keywords:  
Competency,  
Muslim Doctor,  
Medical Ethics.

Submitted:  
October 17<sup>th</sup> 2022  
Reviewed:  
February 2<sup>nd</sup> 2023  
Accepted:  
February 9<sup>th</sup> 2023

### ABSTRACT

**Background:** In the medical profession, a doctor will often be faced with situations of uncertainty to make the right decisions and diagnoses. In this case, making a Muslim doctor to be able to have a good impact on patients. A Muslim doctor is expected to be able to implement professional and reliable competencies in the future. In facing the future, with all the challenges in the medical world, ethical principles, moral values and good competence are needed in order to be able to provide the best health services by minimizing risks and side effects, and prioritizing greater benefits so as not to harm doctors as service providers, and patients as recipients of health services.

**Objective:** This study aims to learn more about the definition and principles of medical ethics, muslim doctor competence, and Islamic medical moral values.

**Methods:** The article source in the same field was compiled. Through a several literature search of reputable journals wich maximum published in the past 10 years.

**Result:** Several article was found, and all the article said the moral values in Islamic medicine are closely related to the personality of Muslim Doctors.

**Conclusion:** The guidelines for islamic medical ethics as muslim are Qur'an, Hadist, Ijma' and Qiyas. The four main moral principles for be a good doctor are the principle of autonomy, beneficence, non-maleficence, and the principle of justice. The competence of Muslim doctors has a close relationship with ethical principles, moral values, and law. The moral values of muslim doctors includes self-awareness, such as awareness of fitrah (inne-rself) and social awareness as caliph (external-self-awareness).

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### Introduction

In the medical profession, a doctor will often be faced with situations of uncertainty to make the right decisions and diagnoses. In this case, making a Muslim doctor to be able to have a good impact on patients. A Muslim doctor is expected to be able to implement professional and reliable

competencies in the future. In facing the future, with all the challenges in the medical world, ethical principles, moral values and good competence are needed in order to be able to provide the best health services by minimizing risks and side effects, and prioritizing greater benefits so as not to

harm doctors as service providers. and patients as recipients of health services.

### **Objective**

This study aims to learn more about the definition and principles of medical ethics, muslim doctor competence, and Islamic medical moral values.

### **Methods**

The article source in the same field was compiled. Through a several literature search of reputable journals wich maximum published in the past 10 years.

### **Result and Discussion**

#### **1. Medical Ethics**

Ethics or what is called (ethos) medicine is the principle of pragmatic provisions that contain things that can be done or avoided. Ethics means the science of what is usually done or the science of customs(Romadhon, 2013).

The guidelines for Islamic medical ethics as Muslims are none other than the Qur'an. Hadist, ijma' and qiyas. As Muslims, these four guidelines are very important. Where a Muslim doctor not only provides medical treatment but also pays attention to the treatment halal. The understanding of medical ethics has been contained in maqashid syariah, where maqhasid syariah is God's rules revealed to guide humans in regulating their

relationship with God, humans, nature and life in order to create the benefit of mankind (Sutisna, 2020).

The development of ethics in the medical world is now more widely known as bioethics. Bioethics has been known since centuries ago. The very fast development in the medical world is carried out with the purpose that the medical profession is always ready to answer the challenges of an increasingly fasted and . Just as health information can be accessed easily and quickly, then there is also an online consultation application that makes it easier for everyone to get information related to their health. different from the past, where a doctor was considered more capable with health problems, in contrast to ancient times, where a patient could not access health knowledge on the internet because the internet was less sophisticated at that time.(Suryadi, 2009).

However, everything that exists still has to follow the existing code of ethics, because the medical code of ethics can align good and right goals (Romadhon, 2013).

In Indonesia, Article 1 paragraph 1 Permenkes No. 290 of 2008 describes the approval of medical action, that informed consent is the consent given to the patient and the patient's family after

receiving a complete explanation of the medical action. Hippocrates explained that in the medical world, informed consent has become a moral obligation of medical ethics before taking medical action (Wagiu et al., 2017).

The code of ethics in Indonesia is different from western countries, especially the United States, the AMA (American Medical Association) regulates in the form of informed consent, communication and decision making. In this context, patients will get information about the patient's medical condition directly and quickly. However, the clinician also considers the medical condition little by little depending on the patient's readiness and also considers the principle of patient autonomy and also the principle of beneficence (Prawiroharjo et al., 2020).

## 2. Principles of Medical Ethics

The principles of medical ethics are closely related to four moral principles, namely, patient autonomy, the principle of beneficence, non-maleficence and justice. These four moral principles are important in the doctor's obligation for patient health. But this is different with western and eastern countries. In the United States, Finland, Canada and England, which are included in western countries, more tightly adhere

to the principle of autonomy so that patients are free to determine their health without coercion from others. Meanwhile, in Eastern countries, especially Japan, Turkey, Lebanon, Kuwait and Saudi Arabia, they adhere to the principle of hierarchy (patriarchal culture), where all decisions are not entirely up to the patient involved but also to their family.(Prawiroharjo et al., 2020).

The four main moral principles include:

- a. The principle of autonomy (respect for human dignity)
- b. The principle of beneficence (benefit)
- c. The principle of non-maleficence (no harm)
- d. The principle of justice (justice)

In the 4 main moral principles, it is hoped that a doctor will have these 4 principles so that there will be no negligence in health services and eventually lead to death.

- a. The principle of autonomy (respect for human dignity)

The principle of autonomy is often referred to as respecting human dignity. The main meaning of autonomy is personal or individual rules that are free, both free from interference from others and from limitations that can hinder right or bad choices. A person who is limited in his own autonomy is someone who is

controlled by others or someone who is unable to act according to his desires and plans (Suryadi, 2009). Thus, it is hoped that a Muslim doctor can respond to the autonomy of a patient properly and correctly.

There are several ways to deal with individual autonomy, including: respecting the patient's personal rights, giving the patient freedom of decision without any coercion from any party, keeping important or confidential patient information, conveying the truth to the patient or patient's family, helping patients make decisions. good and useful without harming the patient and allowing the patient to choose a therapy or treatment that is considered good by him (Suryadi, 2009).

b. The principle of beneficence (benefit)

The principle of beneficence is also called doing good deeds. Good deeds are said to help according to the obligations of fellow colleagues.

It is said that a Muslim doctor has applied the principle of beneficence when he does it without expecting anything in return (without any strings attached). Often there is a misunderstanding between doctors and patients on the basis that they are more concerned with personal

interests than the public interest (the patient) (Suryadi, 2009).

c. The principle of non-maleficence

The principle of non-maleficence is also called doing actions that are not harmful. This principle is known as "primum non nocere" or as "do no harm". In health services, it is hoped that a doctor can provide treatment that has minimal risks and side effects but has great benefits (Suryadi, 2009)

So it is hoped that in applying this principle you can do it carefully and consider many things in order to provide good treatment according to patient complaints (Diab, 2016).

d. Principle of justice

The principle of justice is defined as upholding justice or equal rights to everyone (patients). It is said to be fair if a Muslim doctor can provide health services according to his rights and conditions. Justice cannot be beaten evenly in the matter of health care because every patient has a complaint for himself.

So it is hoped that a Muslim doctor can use several principles in applying the principles of justice, including:

- 1) Fair according to his needs
- 2) Fair according to the effort
- 3) Fair according to contribution

- 4) Fair according to the benefits and uses (Suryadi, 2009).

### 3. Muslim Doctor Competence

The Big Indonesian Dictionary 2002 states that competence is the authority (power) to determine or decide something. A Muslim doctor has been equipped with knowledge, skills, to provide health services to others (Romadhon, 2013).

The competence of Muslim doctors has a close relationship with ethical principles, moral values and law. Ethical principles come purely from within oneself, while moral values as a reference for one's behavior and law as a basis for someone to apply an action to the wider community (Suryadi, 2009).

Ethical principles and moral values in the medical profession have a relationship with competence between doctors and patients. Doctor's professional obligations are described in the professional oath, professional ethics, service standards and various operational procedures. These obligations are rules that must be followed in order to achieve protection, both for doctors as service providers and patients as recipients of health services (Suryadi, 2009).

A Muslim doctor must be professional in various promotive, curative, preventive and rehabilitative

aspects, it is hoped that a Muslim doctor can pay attention to several things, including:

#### a. Keeping Religion (hifzud-din)

Maintaining religion has become the obligation of every Muslim regardless of profession, but for Muslim doctors it is an aspect to maintain the straightness and obedience of the faith of himself, the patients being treated and the environment.

It has been explained in the Qur'an Surah 51: verse 56:

Which means: "And I did not create the jinn and humans, except that they worship Me".

The verse above gives extraordinary moral meaning, it is conveyed that every human being is obliged to maintain religion as a form of worship to Allah SWT(Suryadi, 2009).

#### b. Guarding the Soul/Self (hifzun-nafs)

A Muslim doctor is expected to improve his quality by continuing to live his life with passion and doing productive things for himself, his patients and the environment.

It has been explained in the Qur'an Surah 2: verse 179:

"And in the qishash there is (guaranteed survival) for you, O

people of understanding, so that you may become pious."

The verse above provides an extraordinary moral message, where a Muslim doctor is expected to maximize his efforts in health services and always improve his quality by adding new knowledge in the medical world (Qotadah, 2020).

c. Keeping Intellect (hifzul-aql)

A Muslim doctor is expected to maintain common sense by increasing his knowledge through health books and the latest health news.

It has been explained in the Qur'an Surah 5: verse 90:

Which means: O you who believe, verily (drinking) alcohol, gambling, (sacrificing for) idols, drawing fate with arrows, are heinous acts including the actions of Satan. So stay away from those actions so that you get good luck(Qotadah, 2020) .

The verse above provides an extraordinary moral message, a Muslim doctor is expected to continuously add and practice knowledge.

It has been explained in a hadith that reads: Meaning: whoever takes a path to seek knowledge, Allah will make the path to heaven easy for him. (HR. Muslim no 2699).

d. Protecting offspring (hifzun-nasl)

A Muslim doctor is expected to be able to maintain offspring in order to create healthy and quality offspring.

It has been explained in the Qur'an Surah 17: verse 32:

Which means: "And do not approach adultery, verily adultery is an abominable act. And a bad way"(Qotadah, 2020) .

The verse above gives a moral message that every Muslim doctor can take care of offspring by not having an abortion on a healthy fetus unless there is a danger to the baby or mother, and paying attention not to mix men and women who are not mahrom and are not in professional or work matters (Suryadi, 2009).

e. Safeguarding Assets (Hifdzun maal)

A Muslim doctor is expected not only to consider effectiveness (success rate) but also to consider efficiency in determining an action, diagnosis or therapy.

It has been explained in the Qur'an Surah 17: verse 32:

Which Meaning: "And do not squander (your wealth) extravagantly. Verily, the spenders are the brothers of Satan, and the devil is a complete disbeliever in his Creator."

The verse above provides an extraordinary moral message, where a

Muslim doctor is expected to provide good treatment to his patients and not spend his wealth on disgraceful things (Suryadi, 2009).

#### 4. Islamic Moral Values

Moral values in Islamic medicine are closely related to the personality of Muslim doctors. A good and professional Muslim doctor can have a good impact on his patients. This is reflected in the awareness of nature and high social awareness as a caliph for himself and his environment (Self awareness).

Tasha Eurich in his research, classifying self-awareness there are 2 types including:

- a. Have a high awareness of fitrah (Inner-self-awareness)

Inner-self-awareness or what is called ISA has the ability to see values, passions, aspirations and reactions within oneself. The ability tendency of a doctor who has a high ISA can control himself in the internal world. So that people who have a high ISA are less likely to experience anxiety, stress and depression (Nadeak, 2015)

- b. Have a high social awareness as a caliph (External-self-awareness)

External self-awareness or what is known as an ESA. ESA have the ability to see what other people think

of us. This kind of thing is really needed by a doctor because it can make a Muslim doctor more sensitive to his environment. A Muslim doctor will be faced with the wider community, therefore this high awareness attitude allows a Muslim doctor to implement his knowledge in the field of Health and make every action contains high empathy that makes the patient feel comfortable and avoids anxiety and restlessness (Nadeak, 2015).

There are several ways to build self-awareness in a Muslim doctor, including the following:

- a. Dare to take risks and get out of your comfort zone.

A Muslim doctor is expected to pay attention to his every action, both in terms of diagnosis and therapy. A Muslim doctor can choose the best course of action for his patients in order to create a sense of trust and comfort between doctors and patients

- b. Creating harmony and togetherness in the world of work, especially among colleagues.

A Muslim doctor is expected to be able to establish good relations with his superiors and colleagues. Good relationships will create good and productive things.

- c. Have a high curiosity

A Muslim doctor is expected to improve the quality of knowledge. Not only in the quality of knowledge but also a high sense of empathy between others.

- d. Enjoy exchanging opinions with colleagues and coworkers

A Muslim doctor is expected to be able to exchange opinions in the form of knowledge and experience because in the world of the medical profession, health information includes knowledge that has a very broad and fast scope.

- e. Always give positive response and support

A Muslim doctor is expected to be able to give each other a positive response and support to his colleagues. These positive energies will have a good impact on yourself and others (Nadeak, 2015).

## Conclusion

The guidelines for Islamic Medical Ethics as Muslim are Qur'an, Hadist, Ijma' and Qiyas. The four main moral principles for be a good doctor is the principle of autonomy, beneficence, non-maleficence, and the principle of justice. Moral values in Islamic medicine are closely related to the personality of Muslim Doctors. The competence of Muslim doctors has a close relationship with ethical principles, moral

values, and law. The moral values for muslim doctors includes self-awareness, such as awareness of fitrah (inne-rself) and social awareness as caliph (external-self-awareness).

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## Literature Review: Green Marketing Strategy and Green Hospital to Achieve Sustainable Competitive Advantage

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DOI : 10.33086/iimj.v4i1.3854

### ARTICLE INFO

Keywords:  
Green hospital,  
green marketing,  
sustainable  
competitive  
advantage

Submitted:  
February 2<sup>nd</sup> 2023  
Reviewed:  
February 5<sup>th</sup> 2023  
Accepted:  
February 23<sup>th</sup>  
2023

### ABSTRACT

**Background:** The concept of green hospital and green marketing is still rarely applied to hospitals in Indonesia. Even though this strategy is a very good potential. In addition to playing a role in environmental conservation, hospitals can achieve Sustainable Competitive Advantage.

**Objective:** The aim of this article is focused on green marketing and green hospital strategies and their role in increasing sustainable competitive advantage.

**Methods:** This article is a literature review of 7 journals from several sources such as Google Scholar, SINTA Journal, and pubmed in the last 10 years.

**Result :** The core concept of green hospitals focuses on the production and use of energy, water resources, the use of solar energy for electricity and reducing electricity use, good aeration, climatic features, green open spaces and the long-term impact of building materials. The concept plays a role in improving public health while reducing the environmental impact around it. Green marketing is one of the strategies that the hospital marketing team uses today as the key strategy for SCA.

**Conclusion:** In the end, this concept has 2 goals, improving environmental quality and customer satisfaction. Thus, the implementation of green marketing into a marketing strategy can be the key in achieving sustainable competitive advantage in hospitals.

### Introduction

The environmental health problems that are developing today are more or less influenced by health services. The healthcare industry, especially hospitals, contributes to significant sources of pollution around the world. This is due to the application of products and technologies, resource consumption, waste production, construction and operations. Hospitals can produce more than 2.4

million tons of waste annually (Azmal et al. 2014). Whereas the waste generated during health services has more potential risk of infection and injury than other types. This environmental management does not seem to be the main focus of governments and health care providers, especially in developing countries.

As Florence Nightingale stated, environmental health is considered a key

issue raised in the development of green marketing strategies. The American Marketing Association (AMA) defines green marketing as the process of marketing for products that are assumed to be environmentally safe (Afifi and Amini 2018; Azmal et al. 2014; Widyastuti et al. 2019). The concept of green hospital is part of the development of this marketing, the purpose of which is to reduce the effect on the environment of goods and services delivered by health care providers (hospitals) (Afifi and Amini 2018; Sofiyannurriyanti 2017). It aims to attract customers who focus on sustainability or environmental activists. Customers will tend to choose products that are environmentally based / green products. This is one of the advantages that can be developed by hospitals to be able to achieve a sustainable competitive advantage.

In Indonesia, the hospital industry is growing significantly. However, only five hospitals in Indonesia have implemented the green hospital concept, namely: Ciputra Hospital, Persahabatan Hospital, Prof. Dr. Soerojo Hospital, Pekerja Public Hospital, and Siloam Hospital. The application of green hospitals and green marketing itself still does not meet the needs of the community, unaffordable service prices, poor information technology, lack of investors who care about the environment

and the preference of the Indonesian people towards green hospitals abroad is still high (Afifi and Amini 2018). Yet this is a global effort to address climate change and protect the environment. However, the literature on this green concept has not been discussed much. Based on this phenomenon, the author wants to investigate the application of green marketing strategies in green hospitals in order to increase sustainable competitive advantage in the hospital industry.

This article is a literature review that discusses green marketing strategies to achieve sustainable competitive advantage. This is expected to provide insight for hospital managers in strategizing to build and maintain the business position of their hospitals.

## **Methods**

The literature used in this review was obtained from several sources such as Google Scholar, SINTA Journal, and pubmed. The keywords used to conduct literature searches are "Green Hospital", "Green Marketing", "Sustainable Competitive Advantage" and "Hospital". The publication of articles/literature is limited to 2010-2020 only. 7 articles were obtained that fit the criteria for further analysis in this literature review. The review focused on green marketing and green hospital strategies and their role in

increasing sustainable competitive advantage.

## Results and Discussion

### *Green hospital*

Green hospital is a hospital concept that designs the main resources of the hospital to be environmentally friendly and save more expenses and provide more alternative improvements (Afifi and Amini 2018; Azmal et al. 2014; Sofiyanurriyanti 2017; Wood et al. 2016). The concept of Green hospital in Indonesia has been developed by Green Building Council Indonesia with standard green building criteria, such as reducing pollution, energy use, and the right environment for consumers (Afifi and Amini 2018). Green hospital is also a hospital commitment to continue to improve public health by reducing environmental impact and ultimately reducing the burden of disease (Azmal et al. 2014; Wood et al. 2016). Green hospital connects local needs with environmental action. The concept can be achieved by primary prevention methods through active participation in public health and the environment.

The core concept of green hospital focuses on energy production and use, water resources, the use of solar energy for electricity and reducing electricity use, good aeration, climatic features, green open

spaces and the long-term impact of building materials. Building strategies in green hospitals reduced building operations by 89 percent, increased building value by 7.5 percent, return on investment by 6.6 percent, increased occupancy ratio by 3.5 percent, and increased rental ratio by 3 percent (Wood et al. 2016). Other green hospital concepts are waste reduction, energy reduction and also protecting resources; protecting resources including managing waste disposal, recycling, reproducing reusable items and items, managing product protection and so on. The provision of land for green open space is not only for soothing or sweetening, but has another function to provide open space for patients, families and staff in the hospital, so that they can breathe fresh air and provide psychic benefits for patients.

To meet the concept of Green hospital, it is necessary to plan from the beginning. Planning starts from the hospital strategy, the concept of the building to be carried out, the person in charge of operations, the funds needed, and so on. The application of Green hospital will affect the quality of the hospital (Afifi and Amini 2018). The cleaner, the more comfortable, the healthier the hospital, the better the quality of the hospital. With this concept, RS can increase public trust. Although models for green hospitals are still being developed, many

hospitals and health systems in the world have taken steps to reduce their environmental impact, help improve public health and also reduce costs simultaneously (Azmal et al. 2014; Sofiyannurriyanti 2017; Wood et al. 2016).

### **Hospital Green Marketing Strategy**

The concept of green marketing has been developed since 1980-1990 through an article in one of the marketing journals. According to the American Marketing Association (AMA), green marketing is the development and marketing of products designed to reduce the physical impact on the environment or improve environmental quality (Afifi and Amini 2018; Azmal et al. 2014; Sehgal 2017; Widyastuti et al. 2019). Green marketing focuses mainly on the promotion of green products. Marketers also have a responsibility to make consumers understand the need and benefits of green products rather than regular products.

The increase in the use of Green marketing depends on five reasons. First, organizations feel environmentally friendly marketing to be an opportunity that can be used to achieve goals. Second, organizations believe that they have a moral obligation to be more socially responsible. Third, the Government made regulations requiring hospitals to become more environmentally responsible. Fourth,

competing hospitals that have implemented green marketing first force managers to change marketing strategies. Finally, cost factors associated with waste disposal, or reduced material use force hospitals to modify strategies and behaviors.

In the research of Hamid et al. it was found that most customers who are less concerned about the environment are not interested in consuming green products. Without government appeals/regulations, the level of customer trust in green products is still underdeveloped, making them less concerned about the benefits produced (Widyastuti et al. 2019). The lack of an environmentally friendly marketing strategy significantly affects customer satisfaction so managers need to know the importance of an environmentally friendly marketing strategy to increase customer satisfaction.

In this era, the formation of public awareness of environmental sustainability is increasing. Hospitals should pay more attention to green marketing as a marketing strategy. Rising public awareness has influenced the tendency of companies to become more concerned about environmental protection as part of social responsibility. Companies with green products tend to influence environmentally friendly purchasing decisions. Consumer purchasing decisions are based on the safety

of the service and do not harm the environment. It is caused by the increasing public trust in companies that run environmentally friendly businesses. This will influence customers to loyally use the services offered. Therefore, the fulfillment of the element of environmental comfort is one of the considerations of patients in the selection of hospitals (Hasan and Ali 2015; Widyastuti et al. 2019).

### **Green Marketing to Achieve Sustainable Competitive Advantage (SCA)**

Green marketing is one of the strategies that the hospital marketing team uses today as the key strategy for SCA. One study in India also states that the practice of green marketing allows companies to have a sustainable competitive advantage (Hasan and Ali 2015; Sehgal 2017). Leonidou et al also agree that an environmentally friendly business strategy leads to a position of competitive advantage. By implementing the green marketing process into the marketing strategy, the hospital will build a good corporate image in the community. This fact shows that the implementation of green marketing into marketing and CSR strategies is useful in forming a positive green image in the eyes of the public (Widyastuti et al. 2019).

Sehgal's research reveals that customer trust in eco-labels and eco-brands and consumer perceptions of eco-brands show a

positive and significant impact on consumer behavior (Sehgal 2017). Consumer behavior here means the process that a person or organization goes through in finding, buying, using, evaluating, and disposing of products or services after consumption to meet their needs. Eco-label is referred to as one of the green marketing tools by conveying information about environmental protection through product labels (Sehgal 2017).

Hospitals that have concern for environmental protection and practice the green hospital philosophy to carry out marketing activities will enjoy a competitive advantage in today's global market, especially in the rapidly growing economic market. Thus, Green marketing can guarantee sustainable long-term growth, increase profitability, help product marketing while maintaining environmental concerns, assist in breaking through new markets and enjoy sustainable competitive advantage benefits.

Green marketing strategies to achieve SCA can be built by improving the quality of service (interaction and outcomes) with hospital customers (Afifi and Amini 2018). However, this does not mean that this strategy does not have obstacles. Hospitals may face problems such as rising costs and prices.

## Conclusion

Green marketing is not limited to the production process of environmentally friendly services but includes all marketing activities necessary to develop and maintain the environmentally friendly attitudes and behaviors of service providers and customers. It should be understood that green marketing has two goals, namely improving environmental quality and customer satisfaction. Thus, the implementation of green marketing into a marketing strategy can be the key in achieving sustainable competitive advantage in hospitals.

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## The Effect of Virtual Learning on Medical Student Professionalism: A Systematic Literature Review

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DOI: 10.33086/iimj.v4i1.3518

### ARTICLE INFO

#### Keywords:

Medical Ethics,  
Professionalism,  
Virtual Learning.

Submitted:

September 30<sup>th</sup>  
2022

Reviewed:

January 16<sup>th</sup> 2023

Accepted: March  
17<sup>th</sup> 2023

### ABSTRACT

**Background:** Education is an action to develop a potential of human resources accompanied by learning facilities. Education itself has long been attached and developed in human life until now. The number of Covid-19 transmissions in Indonesia is increasing and causing many victims. To break the chain of spreading this virus, the government has formulated a policy that requires students throughout Indonesia to study from home. So that the learning process is free from these conditions, alternative steps are taken, namely through virtual learning.

**Objective:** The purpose of this study is to compare the literature that has subject matter related to evaluating journals according to the PRISMA and PICO (Problem, Intervention, Comparison, Outcome) methods. Some data were taken from ten articles that were included in the inclusion criteria, including year, keywords, research title, population.

**Methods:** This systematic literature review is based on an analysis of the literature available in the Pubmed, Elsevier, and Google Scholar databases in English.

**Results:** From the 10 literatures that have been analyzed, 8 of them state that virtual learning is considered to have the potential to create professional values for medical students

**Conclusion:** The COVID-19 pandemic has certainly had an impact on learning activities and could affect the professionalism of medical students, but this can be overcome if the campus is able to provide adequate facilities.

### Introduction

Education is an action to develop a potential of human resources accompanied by learning facilities. Education itself has long been attached and developed in human life until now (Mahmudah, 2020). There are

two methods that have been broadly applied in human daily life, such as face-to-face education and virtual education.

The main feature of virtual education is the physical isolation between teacher and students. The existence of this physical

separation increases the behaviour of teachers and students that are different from their behaviour in face-to-face education. In distance education, students who want to be successful must have independent learning, because students must act as teachers, especially in motivating themselves to learn. Based on the condition of students receiving face-to-face and distance education, it seems that there is a gap. Students in virtual education must study independently with students who receive face-to-face education.

The number of Covid-19 transmissions in Indonesia is increasing and causing many victims. To break the chain of spreading this virus, the government has formulated a policy that requires students throughout Indonesia to study from home. So that the learning process is free from these conditions, alternative steps are taken, namely through virtual learning.

In the context of virtual learning, independent learners have the ability to learn in conditions that requires them to be completely independent from their teachers. There are four dimensions of autonomous learning, namely:

- a) Autonomy
- b) Self-management
- c) Need to learn independently
- d) Learner control over learning

As a medical student, we are always requiring to prioritize professionalism in

dealing with problems. In the problem of face-to-face learning with distance learning, medical students take on the role of health consultants and provide critic and solutions. Therefore, the different effects on face-to-face learning with virtual learning can increase the sensitivity of medical students.

## Methods

In the era of evidence-based medicine or what is known as evidence-based medicine, clinicians must be able to apply the results of peer reviewed scientific research to individual patients in carrying out their duties as doctors. This type of research is a type of systematic literature review.

This systematic literature review is based on an analysis of the literature available in the Pubmed, Elsevier, and Google Scholar databases in English. The purpose of this study is to compare the literature that has subject matter related to evaluating journals according to the PRISMA and PICO (Problem, Intervention, Comparison, Outcome) methods. From the search results using the keywords COVID-19, virtual learning, professionalism, medical students found as many as 73 literatures were found.

## Result and Discussion

Based on ten selected literatures, all samples used were medical students. Two



articles focused on clinical medical students, while the other focused on preclinical medical students. Various kinds of intervention methods are used to obtain the relationship between virtual learning methods and the professional value of medical students, for example in research that has the same intervention method, namely the study by Sani *et al* (2020); Hilburg *et al* (2020); and Afonso *et al* (2020) which mentions the use of virtual teleconference to fulfil teaching and learning activities for medical students during the Covid-19 pandemic. In a study by Findyartini *et al* (2020) in this study they used written reflection analysis during the COVID-19 pandemic through the PIF (Professional Identity Formation) lens method. In the research of lancu *et al* (2020) with the use of telemedicine, the intervention was also used by Afonso *et al* (2020). In a study by Nivamat *et al* (2021) mention intervention by providing e-learning modules to medical students during virtual learning. In research by Think *et al* (2021) conducted a multicentric during the COVID-19 pandemic from 2 February 2021 to 1 April 2021 through social media. In a study by Park *et al* (2021) using the intervention of identifying research questions, identifying relevant literature, selecting included studies, mapping data, compiling, and summarizing. In a study by Tabatabai (2020), this study

uses a virtual reality simulation (VRS) intervention where students will feel like they are in a different environment. It is very possible for medical students to learn from clinical experiences through virtual simulations as they would in real hospital-based experiences. Meanwhile, in the research of Mulcare *et al* (2020) an intervention in making an 8-hours modular curriculum based on simulation was carried out using the PEARLS question and answer framework with video-based meetings that focused on “website manner”.

Almost all of the comparisons raised in the literature compare learning before COVID-19. However, there are 2 other literatures that compare the student adaptation process and coping strategies in the face of a pandemic; student adaptation process for learning; and the role of medical students during the pandemic, it is mentioned in the literature by Findyartini *et al* (2020) and Park *et al* (2021).

From the results of these studies, four literatures show that telemedicine has the potential to increase the value of professionalism, knowledge, communication skills, and technological literacy, including research by lancu *et al* (2020); Sani *et al* (2020); Afonso *et al* (2020); Mulcare *et al* (2020). For the results of research by Findyartini *et al* (2020) stated that the students in this study, seemed

to be able to use adaptive coping mechanisms, this is certainly very helpful for students in the formation of professional identities. Then in research by Nivamat *et al* (2021) stated that competency-based medical education (CMBE) in an e-learning system supports skills development and focuses on professional training to produce Indian medical graduates who are globally competitive and can meet the growing health needs of the public. And also there are contradictory research results, there are two literatures by Hilburg *et al* (2020) and

Tabatabai (2020) stated that virtual based medical education has been considered superior to traditional education due to the COVID-19 pandemic so that it can replace face-to-face lectures and small group meetings, but in the other two literatures by Thind *et al* (2021) and Park *et al* (2021) stated that the development of new education (virtual learning) is still full of challenges and is still considered ineffective and also there are still many students who pay less attention to learning during online lectures.

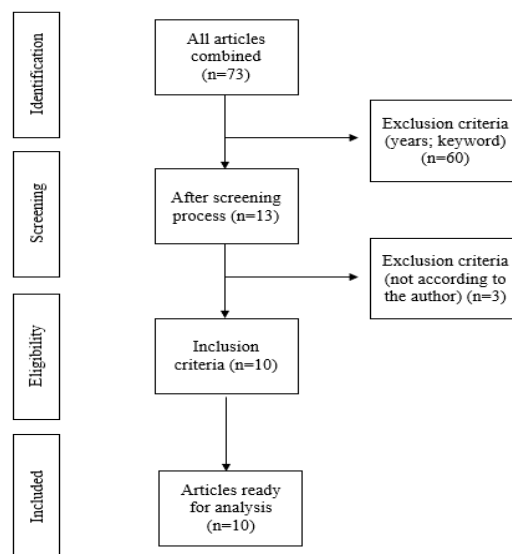


Figure 1. PRISMA Flowchart

### Article Analysis

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
1	Unmuting medical Students Education: Utilizing Telemedicine During the COVID-19 Pandemic and Beyond	Iancu et al, 2020	Pre-clinical medical student	Use of telemedicine	Before pandemic	Optimal use of telemedicine but not limited to communication, physical examination, professionalism and technological literacy
2	Exploring medical students' professional identity formation	Findyartini et al, 2020	Pre-clinical medical student	Written reflection analysis during COVID-19 pandemic using the PIF	Student adaptation processes and coping	The students in this study appeared to be able to use adaptive coping mechanisms. Clinical student appears to be facing greater challenges in

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
	through written reflections during the COVID-19 pandemic			(Professional Identity Formation) lens methods.	strategies in dealing with the pandemic; their adaptation process to study; and their role as medical students during the pandemic	adapting their learning than preclinical students, due to the temporary cessation of clinical rotation during the pandemic, which has prevented clinical students from having real clinical experiences
3	Online Medical Education Challenges and Probable Solutions in the Age of COVID-19	Nirmavat et al, 2021	Pre-clinical medical student	Online medical education with providing e-learning modules	Traditional learning	Competency-Based Medical Education (CBME) in e-learning systems supports skills development and focuses on professional training to produce Indian medical graduates who are globally competitive and able to meet the growing health needs of society
4	Impact of the COVID-19 pandemic on Caribbean Medical Students: A cross-sectional study	Thind et al, 2021	Pre-clinical medical student	Conducted a multicentric survey during the COVID-19 pandemic from 2 February 2021 to April 2021, via social media sent to second, third- and fourth- year students in Many Caribbean private medical schools	Face-to-face learning method	Online learning is reported to be less time efficient and many students pay less attention to learning during online lectures.
5	Understanding the consequence of COVID-19 on undergraduate medical education: Medical students' perspective	Sani et al, 2020	Pre-clinical medical students	Enforce the quality of medical education such as conducting virtual interprofessional educational sessions to solve clinical sketches and virtual consultation skills with simulated patients	The impact of education medical students before the COVID-19 pandemic	The implementation of virtual consultations with simulated patients can be an alternative step to overcome the problem of medical education during COVID-19. General practitioners throughout the UK have successfully utilized telephone and video consultations to manage patients' complaints, therefore this modality should be aligned with undergraduate medical education
6	A scoping review on adaptation of clinical education for medical students during COVID-19	Park et al, 2021	Pre-clinical medical student	Identification of research questions identifying relevant literature, selecting included studies, mapping data, compiling, summarizing, and reporting results	The process of adapting clinical teaching for medical students in responding to COVID-19 from the beginning of COVID-19 until now	New educational developments caused by the pandemic are still fraught with challenges and there is still a lack of evidence of the effectiveness of virtual education.
7	Medical education during the coronavirus disease 2019 pandemic: learning from a distance	Hilburg et al, 2020	Pre-clinical medical student	Adaptation of social restrictions in medical education by using video conference software, social media platforms and open access medical journals	Face-to-face learning before COVID-19	The COVID-19 pandemic has necessitated the adoption and implementation of technologies already available in medical education. In many institutions Zoom and similar video conferencing platforms such as BlueJeans and Microsoft Teams have now replaced face-to face lectures and small group meetings.
8	"I Have a Cough": An interactive virtual respiratory	Afonso et al, 2020	Pre-clinical medical student	By providing interactive online modules in three sections for preclinical	Learning methods before COVID-19	This session was conducted for 122 first rear medical students. This module was well received by students. Majority felt that it helped improve

No	Title	Authors, year of Publication	Population	Intervention	Comparison	Outcome
	case-based module			medical students (first and second years) who have not studies the respiratory physical examination, among others through video conferencing software and telemedicine		their telemedicine communication skills (93%), interpretation of physical examination findings (84%), development of differential diagnosis (95%), and correlation of clinical, and clinical basic science content (93%)
9	COVID-19 impact and virtual medical education	Tabatabai, 2020	Pre-clinical medical student	Virtual Reality Simulation (VRS) has the unique ability to make students believe they are in a different environment. This allows medical students to learn from real hospital-based experiences	Traditional education methods	Virtual simulation-based medical education has been found to be superior to traditional clinical education
10	Advanced communication and examination skills in tele medicine: A structured simulation-based course for medical students	Mulcare et al, 2020	Pre-clinical medical student	Creating a simulation-based-8-hour modular curriculum using the PEARLS question and answer framework with video-based meetings focused on a “website manner”	Traditional learning	Out of 98 medical students in their first clinical year participated in 2019. Of the participants, 97% were enthusiastic about the course, 100% they felt simulation was an effective mechanism for delivering educational materials. After participation, 71% believed that telemedicine had the potential to become part of their future practice; 92% feel an improvement in their comfort and ability to conduct video-based patient encounters.

**Conclusions**

Of the 10 literatures that have been analysed, 8 of them state that virtual learning is considered to have the potential to create professional values for medical students. The COVID-19 pandemic has certainly had an impact on learning activities and could affect the professionalism of medical students, but this can be overcome if the campus is able to provide adequate facilities. This is done so that the virtual learning activities of medical students remain effective and optimal so that the professional value of medical students is maintained.

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