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Editorial

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We planned to have the 2021 International Multidisciplinary Conference on Productivity and Sustainability in person at the sight of a sandy beach and waving palm trees in Bali. But the COVID-19 pandemic crushed our dream of an ideal conference and taught us the hard way to be flexible with unforeseeable circumstances. This global pandemic will become a constant reminder of qualities every scholar should possess including adaptability and the ability to collaborate. As science continues to evolve, it necessitates multidisciplinary approaches to solve problems. Additionally, many challenges are often shared that require collaborative efforts of researchers from different institutions and fields to resolve the problems.

Following the fourth industrial revolution (Industry 4.0), HE has undergone significant changes that affected its philosophies, policies, and practices. The Covid-19 Pandemic has also heightened awareness that the global academic community needs to find new ways of coping with the physical, psychological, and economic difficulties. To realize HE goals for promoting equitable knowledge transfer, innovation, and specialized skills, internationalization and cooperation between HE stakeholders and the industry are paramount. Without a concerted effort and synergy, HE will find it challenging to fulfill the goals without exacerbating substantial equity, productivity, and sustainability issues.

The articles featured in this special issue represent some of the observations and practices of emerging researchers and scholars during the pandemic as they navigate into the new normal. The authors from different disciplines such as health, humanities, and social sciences are faculty

and students who aspire to maintain traditions of inquiry and at the same time challenge the restrictions that the pandemic has resulted for them to conduct research. They propose different types of scholarly writing such as a final project report on fiction writing, literary and text analyses as well as case studies that shed light on what research issues have been of interest. The articles mirror reflections of accepted conceptual ideas and theories in diverse disciplines while acknowledging what ideas continue to be debatable.

Anindya and Mau reported their project creating a novelette titled *Dian-Tara* that depicts a tragic story of two girls who are abused by their father. Using the three-act structures of Aristotle's poetics, Todorov's narrative theory, and Freud's psychoanalytic theory, they developed the plot and characters to present phenomena in society such as domestic abuse done by parents to their children. The gothic fiction style adds the horror element of the tragedy by creating high emotions of fear and suspense. The authors consider the spirit's appearance as the key to unraveling the hidden truth.

Another work is a literary analysis of Felicia and Mau who examined *Things You Save in a Fire* written by Katherine Center. The analysis centers on describing the experience of Cassie Hanwell, the main character, being sexually assaulted and discriminated against in her workplace. They perceived the patriarchal practices from Walby's (1990) patriarchy theory which concept includes six patriarchal structures that maintain men's domination and women's exploitation. The authors found that the assault and discrimination had psychologically affected Cassie in different ways from nightmares to aggressivity and paranoia.

In their report, Hasibuan and Mursita-Putri analyzed the strategies used to translate gaming terms in *Dungeons and Dragons* and whether the translation results were acceptable from the perspective of users. The analyses of three types of data, the transcriptions of a

gameplay session's conversation and interview as well as the acceptability questionnaire, revealed that domestication, foreignization, transcreation, and literal translations were strategies considered effective to translate gaming terms. While the transcreation strategy was unusual and suggested the gamers' creativity and freedom to express their understanding of terms in the source language, literal translation was the most common strategy as gamers converted grammatical structures and translated words individually. The results of translation using the literal translation strategy also showed a higher acceptability score.

Larasati and Rasikawati's article reported their review of literature on comics translation strategies. Despite the popularity of comics as entertainment media, comics translation, especially in Indonesian contexts, has been an area under-researched in translation studies. The review intended to gather data on what previous research had found on problems and strategies to translate them. The findings suggested determining equivalent translations in the target language as the most frequent problem documented in the reviewed studies. This difficulty was due to the different language systems, structures, and cultures between the source and target language. The strategies most frequently used to resolve the problem were borrowing and omission strategies as they were perceived to be more convenient to provide appropriate translation without significantly affecting comprehension.

In their survey to study the mental health literacy perspectives of an ethnic group in Indonesia, Saya and Novianty found the majority of the group was not aware of symptoms of major depression and schizophrenia. However, they had assigned local terms to describe different symptoms of people with depression, schizophrenia, and trauma. There was a belief that social factors contributed to depression whereas culturally associated practices such as violations

of norms and spirit possession resulted in schizophrenia. The authors concluded that the group considered relatives, friends, and community leaders to be the source for seeking help.

During the pandemic, health providers worked exceptionally harder to care for their patients. Sutanti et al. studied the relationship between the stress level and sleep quality of nurses in Jakarta. In addition to finding a significant relationship between stress level and sleep quality, they found moderate stress levels to be the most frequent type of stress experienced by nurses during the pandemic. The study findings also confirmed previous research that stress level that exceeds one's ability to endure can lead to several health issues such as headaches, irritability, and difficulty sleeping.

Widagdo et al. reported an evaluation of the health education program for the caregivers of persons with Cerebral Palsy (CP). The program aimed at preparing the caregivers to manage nutrition and seizure in children with CP who usually suffers from musculoskeletal disabilities. The program was found to be effective to improve the caregivers' knowledge of nutrition and their ability to provide first aid. Especially during the pandemic, the training can help reduce mortality children with cerebral Palsy are more prone to severe respiratory problems.

In their study of non-performing loans on loan loss provisions, Iskandar et al. examined the impact of moderating foreign exchange rates and mediating non-performing loans on capital adequacy ratios and interest rates in the banking industry. They collected data on loan loss provision, capital adequacy ratio, and interest rate from quarterly reports of three banks in Indonesia. The data analysis using multiple linear regression and path analyses showed that the capital adequacy ratio had a significantly positive effect on the capital adequacy ratio but not interest rates. While the capital adequacy ratio significantly affected loan loss provision, both non-performing loans and interest rates did not. The study recommendations included the

banking industry to increase the loan loss provision by increasing the capital adequacy ratio when the non-performing loans increase.

Gunarso and Stephanie reviewed the existing literature on digital currency using blockchain. The review purpose was to identify what research had found and methods used for studying the applications of blockchain such as cryptocurrency and provide directions for future research in cryptocurrency. The review concluded the advantages and disadvantages of cryptocurrency. The advantages include its relative security and privacy compared to other types of currency as it is not controlled by the government and allows a more secure transaction. Whereas among the disadvantages are a lack of law and supervision and market transparency. The authors suggested that future research identify ways to promote the development and use of cryptocurrencies as well as the various problems associated with their use.

Finally, Gunarso et al. discussed the debates about the possibility of Artificial Intelligence (AI) personhood from the Christian perspective. They referred to the biblical concepts of human existence and characteristics to argue against the criteria of personhood claimed to exist in AI. The authors concluded that no AI could match human beings that are created in the image of God.

As a part of the lesson learned during the pandemic, HE institutions are expected to increase their awareness and responsibility to stimulate multidisciplinary research and global learning in their future endeavors. HE institutions as the catalyst of innovation and change should jointly overcome the political, economic, and sociocultural hegemony as the pandemic has taught us many concerns are global (Rasikawati et al., 2021). The scholarly tradition might remain the same in that established theories and robust methods will continue to strive. But as problems to solve become more complex, some instructional and research practices and

problem-solving approaches should take a dramatic turn. The complexity of challenges facing the world following the pandemic requires HE institutions to revolutionize various processes, including instruction, research, management, community engagement, and industry partnership. Promoting multidisciplinary and international collaboration is essential to lay the foundation for innovations, solve the world's multifaceted problems, and maintain global sustainable development.

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Dian-Tara: A Final Project of Gothic and Tragedy Novelette

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Abstract

This paper explains the process of creating a novelette entitled *Dian-Tara*. The novelette was written in one linear plot with external narration using narrative theory or narratology. Tragedy and gothic fiction were chosen as the genres since they could create a sense of eeriness in the audience. The issues and phenomena raised in the novelette were the impact of a broken family on children and also what society can do to help the victims. This undergraduate final work adapted Aristotle's *Poetics* by having the three-act structure and catharsis for the resolution. The theory of narrative by Tzvetan Todorov was applied for the plot development. Sigmund Freud's psychoanalytic theory was also used for the characters' design in terms of creating their past and how it influenced their decision-making in the story. For the character types, this novelette used a protagonist and an antagonist. The characters' design was separated into three aspects of life (professional, personal, and private). The result of the final work showed that the past life of each protagonist and antagonist character contributed to their decision-making and helped to drive the plot forward as a tragedy was chosen to end the story. Their bad childhood memories and the tragic ending were meant to raise the awareness of the readers, as the impact of this phenomenon cannot be denied.

Keywords: gothic fiction, narratology, tragedy

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Dian-Tara: A Final Project of Gothic and Tragedy Novelette

Out of all child protection legal cases in Indonesia in the last ten years, cases related to children of divorced parents ranked second highest in number (Maradewa, 2020). Out of 963 cases, almost 30% of the cases were children as the victim of problematic parental behavior (277 cases). These cases were usually associated with domestic violence and even the death of the victim. Further data (Maradewa, 2020) also showed that the biological father has the highest percentage of being the perpetrator.

On the other hand, the role of the neighborhood includes the potential to reduce domestic violence as some factors could be considered effective preventive interventions, such as great solidarity, communication, and cohesion in the neighborhood (Kim et al., 2012). In the context of literary study, a piece of literary work could mirror society and real phenomena. A literary work could also reflect the norms and values of a culture in society (Albrecht, 1954). In this study, a novelette was chosen as the medium because it could share a great story in a brief plot and concise words (Masterclass, 2020), which also fit the timeline of this study. Using metaphors and symbols in the novelette could also be culture-specific to certain audiences (Chattah, 2006) to make the message more powerful and impactful. This work was written to portray the impact of a broken family on children and how society reacts to the issue of domestic abuse.

Literature Review

This final work adapted Aristotle's Poetics by having the three-act structure (*hamartia*, *peripeteia*, *anagnorisis*) and catharsis as the resolution. *Hamartia* refers to the time when the characters face an error judgment or tragic flaw. This situation leads to *peripeteia*, which refers to the sudden change or fall of fortune of the characters. *Anagnorisis* refers to recognition, or sudden recall, and can be a moment when the characters find new friends or enemies (Burke, 2014). All of these three elements are driven by the plot of the entire story.

These elements of tragedy can be seen in previous works, including Shakespeare's famous tragedies. Doko and Doko (2017) analyzed the characters of Shakespeare tragedies, such as King Lear, Hamlet, Othello, and Macbeth, who fell into their flaws (*hamartia*) that affected their surroundings and made a sudden change as the plot moved (*peripeteia*). In the end, they realized something went wrong (*anagnorisis*) yet it was too late as they had shattered their own lives and their story ended up as a tragedy.

Todorov (1960), as cited in Adepati and Samanik's (2018), also built the plot development by including the five stages faced by the characters (equilibrium, disruption, recognition, repair of the damage, and return to a new equilibrium). A state of equilibrium is the first stage when characters face their normal life. As the story progresses, the characters will encounter disturbances or problems, which is the stage of a disruption to the equilibrium. After they have experienced the problems, they will recognize that the problem has affected their normal situation, and they come to the stage of recognition. Afterward, the characters will seek ways to escape or fix the problem in the stage of repairing the damage. All these stages lead to equilibrium again if the characters get their normal life back, or it can even lead to a new equilibrium when they have to adjust themselves to a new condition in the story (Todorov, 1960, as cited in Adepati & Samanik, 2018). In this novelette, the characters were separated into the protagonists and antagonists. Sigmund Freud's psychoanalytic theory was used to design protagonist and antagonist characters as they were driven by their past in making their decision.

This work was also written as gothic fiction. The terror and horror appeared in the form of spirits or ghosts as scary creatures. Bennett and Royle (2016) describe ghosts as creatures who are neither completely dead nor alive at the same time. The reason is that they have untold secrets and take the secrets with them when they die, before they can reveal the truth. This can be seen in a classic work, *The Tragedy of Hamlet*, by William Shakespeare. It is when the ghost

of Hamlet's late father appears to his son, telling Hamlet that he was murdered by Claudius, Hamlet's uncle, and demanding that Hamlet seek revenge on Claudius. For this reason, the gothic part does not simply come as a ghost story to scare people. As cited in Bennett and Royle (2016), ghosts do not come and appear from nowhere. They are described in a *context* and with a certain *purpose*.

Methods

The novelette *Dian-Tara* raises the issue of a broken family's impact on children, specifically sexual abuse by the parents, and the death of the children. The story revolves around one linear plot and the setting takes place in the urban city of Jakarta. There are five characters in the novelette: Diana Hadiwidjaya (Dian), Mutiara Hadiwidjaya (Tara), Diandra Susanto (Diandra), Simson Hadiwidjaya (Simson) and Nathan. Diandra is the protagonist and Simson is the antagonist.

Dian and Tara are Simson's daughters, and they are abused by their father. Diandra is the neighbor living next to the Hadiwidjayas' house. She faces her life's lowest point which leads to her death in a car crash. The car crash happens at the same time as Dian's suicide attempt. While Dian dies and her soul leaves her body, Diandra's soul become trapped inside Dian's body. Diandra seeks help to reveal the truth and save herself and Tara from Simson. On her way to escape, Diandra gets help from Nathan, her colleague, who secretly loves her.

Designing the Plot

As this work adapted the Aristotelian theory of tragedies, Diandra's failed career and love relationship, her death in a car crash, and Dian's suicide attempt are the *hamartia*. These events lead these characters to the *peripeteia* when both of them face their sudden changes and fall of fortune (Diandra loses her normal life and Dian dies). The *anagnorisis* is when Diandra notices something strange and fishy about her neighbor after her soul is trapped inside Dian's body. Furthermore, her failure to escape, and then her death when Simson murders her, is the

catharsis or resolution. How Simson finally ends Diandra and Tara's lives is the catharsis or resolution, a tragic ending chosen for this novelette.

This novelette also applied the narrative structure theory by Tzvetan Todorov and has five stages in the plot. At the end of the story, the characters would face a new equilibrium as they could not go back to their normal lives because of the tragic ending. For the gothic part, the idea of the spirit's appearance was also to reveal the unspoken truth. Although Dian's spirit leaves her body and is replaced by Diandra, she still comes to Diandra in the woman's dream to help her understand what is happening inside the house.

Creating the Characters

Both the protagonist and antagonist have their professional, personal, and private lives that drive their decisions and characterization in the story. Diandra's behavior and decisions are influenced by her past experiences. She chooses to forget her traumatic childhood and live her life as normally as she can. Diandra tends to have repression as her defense mechanism (Freud, 1965). Simson is also influenced by his past lives. His childhood memory seems to be "darker" than Diandra's as he murdered someone in his youth. It makes him unable to differentiate right and wrong, as the only thing he understands is to protect himself. As a result, Simson tends to have denial and displacement as his defense mechanisms (Freud, 1965).

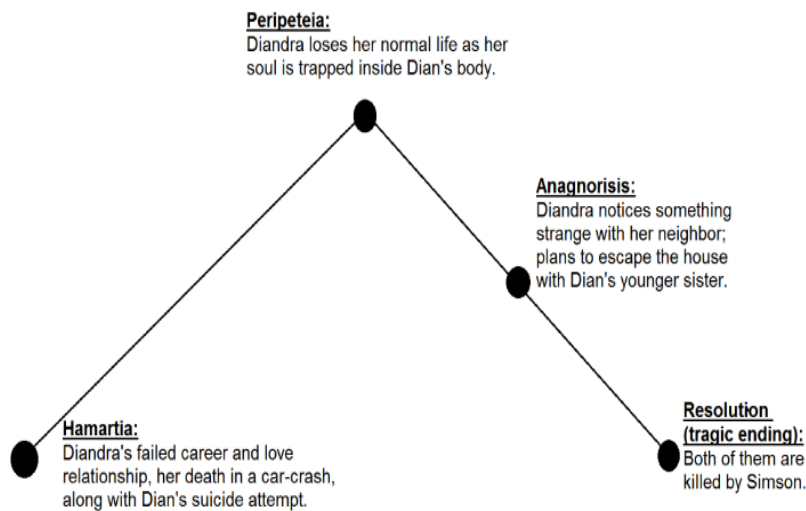
Reflections

Dian-Tara was chosen as the title of this novelette because it tells the whole story. *Diantara* means "in the midst" or "between." The concept of in the middle and between can be seen from different perspectives of each character: Diandra who is trapped in another family's life, and Simson's problematic parental behavior that creates distance between he and his daughters. *Dian-tara* was also formed from the name of the children's characters: Dian and Tara.

The tragic plot can be seen in the following figure.

Figure 1

The Novelette's Tragedy Diagram

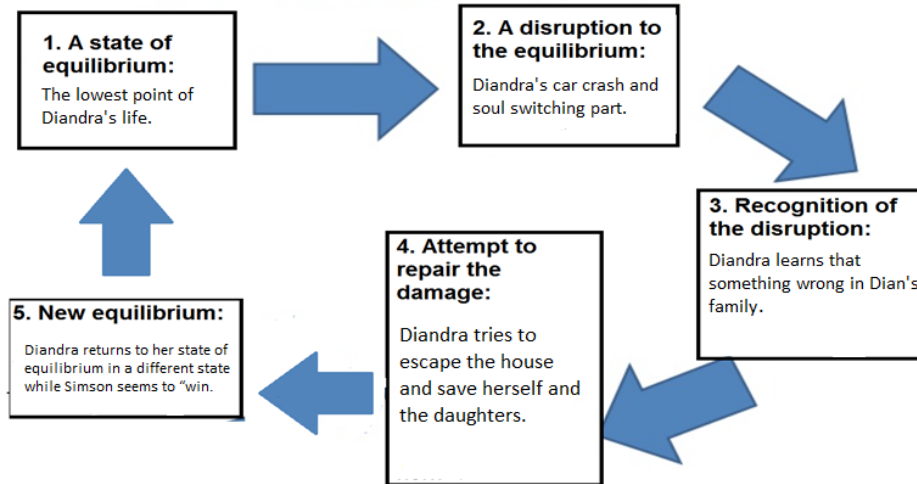


Note: Each chapter of the novelette was also titled by each part of the plot development (Chapter I - *Hamartia*, Chapter II - *Peripeteia*, Chapter III - *Anagnorisis*).

For the plot development, this novelette adapted Tzvetan Todorov's narrative theory. According to Todorov, there are five stages that a character will face in the whole story: a state of equilibrium, a disruption of the equilibrium, recognition of the disruption, an attempt to repair the damage, and a new equilibrium (Todorov, 1960, as cited in Adepati & Samanik, 2018).

Figure 2

The Novelette's Narrative Structure



Diandra's tragic condition, as she dies with an untold secret about her real situation and Simson's mysterious decision, becomes the new equilibrium of this story. Diandra tragically goes back to her first equilibrium, being at the lowest point of life but in the form of a spirit, while Simson seems to succeed in controlling his world to work as he wishes. The new equilibrium is an open ending that allows the reader to interpret or continue the story with their imagination. It does not talk explicitly about what the spirit would do after it has been killed or whether Simson would repeat the same thing to another victim.

As stated in the previous sub-section, Diandra's behavior and decisions are influenced by her past traumatic experiences. She tends to have repression as her defense mechanism (Freud, 1965). Repression refers to an unconscious defense mechanism to keep all bad and threatening thoughts from becoming conscious (McLeod, 2020). She desperately forces her mind to forget her bitter childhood experiences, yet her repressed memories appear in their "altered forms," such as her nightmares.

Simson has bizarre behavior and a bizarre personality. In the story plot, his need is to make everything work under his control and desires. Simson will do whatever it costs to ensure everything moves as smoothly as he wants, including hurting others. This makes Simson have denial as his defense mechanism (Freud, 1965) as he cannot differentiate right

from wrong. The only right things that he knows are defending himself and making everything work according to his wants.

If he is uncontrollably mad, Simson will release his anger on Tara by abusing her physically, though the poor girl does not do anything. Simson uses this condition to threaten Dian if she tries to fight him back. This following excerpt is an example which is written on the chapter I of the novelette.

“Sorry.” Dian took cotton and a small bottle of Betadine from a small drawer beside their bed. She carefully poured the liquid on the cotton and rubbed it on Tara’s bruises.

“Being a mute girl isn't enough and now he wants to make me blind.” Tara moved her lips and hands when Dian tried to heal her bruises. “Tomorrow perhaps he will take my life.”

“Don’t move. And stop saying something bad.”

He would not be hesitant to hit Tara even if it could make the little girl die. This is his defense mechanism, which is displacement. Displacement is redirecting an impulse to another object or target (McLeod, 2020). He redirects his anger to another target, who is Tara, his younger daughter.

The gothic part of this novelette is shown when Diandra is on her way home. She tries to calm herself and fall asleep, but meanwhile the driver cannot find the right way for them to get home. When she wakes up, she realizes that they are lost. They have passed an unknown road that is really quiet and dark, not the usual direction that Diandra takes. They keep passing that road. Diandra slightly hears the sound of a train alarm. The sound becomes clearer as the taxi passes, yet they are still trapped on that strange road. Then, a young girl with black hair appears in front of their eyes with her pale face and bleeding stomach. She is Dian, who has just died after committing suicide. She shows herself as a spirit but she looks

very real in front of Diandra and the driver. Not wanting to hit her, the taxi driver quickly hits the brake, yet the girl disappears, and the brake does not work. The car slams into a train.

Dian's presence before the accident is the cue for the next event that will happen to Diandra. After the taxi has been hit by the train, Diandra loses consciousness. When she opens her eyes, Diandra sees only a void. She tries her best to remember everything that has happened to her and finally remembers the girl who might be responsible for the accident. She is Dian. Then, magically, Dian appears in the void and tells Diandra the secret. This particular part portrays the purpose of having ghosts and spirits in a gothic story as proposed by Bennett and Royle (2016). Dian takes her secret with her before she dies and plans to seek help from people who are still alive.

Conclusion

Writing a tragedy novelette could bring awareness to the audience that the effects of these issues (problematic parental behavior on children and unresolved past lives) should not be denied. Society also has the responsibility to prevent future cases before the real situation ends up as a tragedy.

A literary work itself can mirror the real situation in a society. Genuine and authentic work comes from real situations and experiences. It is important to raise awareness and discomfort toward current issues.

Make sure that every element in the story has its own purpose, for instance, *Why does it use a certain color? Why does it have to be a train, not a car? Why does she always cry alone? Determining the purpose will make the readers engage and empathize with the characters and story. Do not forget to do the research behind the purpose: Is it correct that the blue color is always related to sadness?*

Having a dialect and diversity might also help to make the work as authentic as it can be. Using the local names, inserting the local language in the dialogue, and selecting correct symbols and colors could make the story more interesting and even educate the readers.

Using a detailed depiction of the object can also help the reader to imagine the situation in the work. Describing size, color, and common names or brands might help and make it more interesting.

In conclusion, the most important thing is to know what to write, how to write it, and the purpose of writing that piece of literary work.

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The Impact of Patriarchal Practices on Cassie Hanwell in *Things You Save in a Fire*

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Abstract

This research examined a literary work titled *Things You Save in a Fire*, written by Katherine Center. The novel tells the story of a female firefighter named Cassie Hanwell who faces sexual assault and workplace gender discrimination. There were two research questions addressed in this study. The first question aimed to find the depiction of patriarchal practices in the novel, namely the sexual assault and workplace gender discrimination experienced by Cassie Hanwell. The second question examined the impact of sexual assault and workplace gender discrimination on Cassie Hanwell. This literary analysis applied a qualitative research approach by selecting and grouping the data for analysis. To answer the two research questions, theories of patriarchy, feminism, character, and characterization were applied. The data sources were books and journal articles. The results of the study showed the impact of patriarchal practices on Cassie Hanwell. After the sexual assault and gender discrimination at the workplace, Cassie becomes lonesome and skeptical. She also turns into a paranoid and aggressive person and suppresses her feelings.

Keywords: patriarchy, feminism, sexual assault, gender discrimination, characterization

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The Impact of Patriarchal Practices on Cassie Hanwell in *Things You Save in a Fire*

Introduction

The belief that women are inferior to men can be found in a patriarchal society. Patriarchy gains power from men having greater access to, and the meditation of, the resources and rewards of authority structures both inside and outside the home (Humm, 1992). As a consequence, women are suppressed by society economically, politically, sexually, and psychologically. In the novel *Things You Save in a Fire*, Cassie Hanwell, the main character, becomes a sexual assault victim at the age of 16. She is sexually assaulted by a high school crush, Heath Thompson. Ten years later, she has to face the exact same sexual assault perpetrator and is once again sexually assaulted. Despite the negative impact that Cassie experiences after the sexual assault, the perpetrator is not punished for his actions. In fact, Cassie becomes the one who has to pay for her action because she attacks her assailant during the assault. Her job as a female firefighter is at risk, which makes her move to another fire station. In her new workplace, she is the only female firefighter. Cassie has to struggle at her workplace as she is discriminated against by her male co-workers.

According to National Sexual Violence Research Center (2018), in the U.S., 43.6% of women (nearly 52.2 million) experienced some form of sexual violence in their lifetime. Besides sexual assault, women are also disadvantaged in terms of employment. There is a concerning gap between women and men in terms of work participation. According to the U.S. Bureau of Labor Force Statistics (2019), 57.1% of women participated in the labor force, compared to 69.1% of men. This similar condition can also be found in the Indonesian context. Violence against women increases from time to time. The increase of this violence was almost eightfold in the span of 12 years (Komnas Perempuan, 2020). Of the total reported cases of sexual violence in the private sphere, rape ranked as the second highest form of sexual violence, and the majority of perpetrators were the victim's romantic partner. These victims of sexual violence have to face numerous mental problems. In most cases, a victim of

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sexual violence might face isolation, inability to function in society, emotional responses, fear, anxiety, and anguish (Josse, 2010).

According to KemenPPPA (2019), the work participation gap between women and men was around 30.81% in Indonesia. There were 51.88% of women in the productive age group who were working, while 82.69% of men were working. As stated by Rafail Walangitan, deputy assistant of Kemen PPPA Woman Rights Protection in the workplace, there has been injustice faced by women in the workplace in the areas of job recruitment, opportunities to receive training and promotion, participation in decision-making, retirement age difference, and termination of employment. Noticing the prevalent issues of sexual assault and gender-based discrimination. The researcher decided to study a work of literature that raised similar issues. The novel analyzed in this study was *Things You Save in a Fire* by Katherine Center (2019).

The first research question of this study aimed to find the patriarchal practices in the novel. The second research question intended to find the impact of the patriarchal practices on Cassie Hanwell. The findings were expected to increase the readers' awareness of the negative impact of patriarchal practices on women and the practices of patriarchy that exist in Indonesia. As awareness grows, patriarchal practices, particularly sexual assault, and workplace gender discrimination can be prevented.

Literature Review

As this study aimed to find how patriarchal practices were depicted and what their impact on Cassie Hanwell was, the theories of patriarchy, feminism, character, and characterization were implemented. The patriarchy and feminism theories aided the analysis of patriarchal practices, while the theory of character and characterization allowed the researcher to find the disadvantageous impact on Cassie Hanwell.

The theory of patriarchy was based on Walby's (1991) six patriarchy structures, which can be identified as household production, paid work, the state, male violence, sexuality, and culture. As *Things You Save in a Fire* raises the issue of sexual assault and workplace gender discrimination, this study applied Walby's (1991) patriarchy theory with a focus on male violence and paid work. The male violence is in the form of sexual assault perpetrated by Heath Thompson, while the paid work is evident in the workplace gender discrimination.

For the second theory, the researcher applied feminism theory based on Judith Butler's theory. Butler (1988) argued that there is a set of gender roles assigned by society. This norm is established through the repetition of acts by society. However, gender itself is socially constructed, not an innate notion. The researcher infers that gender is an identity that is gradually built in time. It is an identity that is formed through the repetition of actions. This norm is established in society with the consequence that those who are considered to fail to do their gender right are punished. This rule is a means to uphold patriarchy (Butler, 1990). In this study, the feminist approach was applied to help explain how this social norm was related to the patriarchal practices experienced by Cassie Hanwell. The patriarchal practices are reflected through the events where Heath Thompson sexually assaults Cassie Hanwell. Captain Murphy and the firefighters in Lilian Fire Department also discriminate against Cassie Hanwell.

The third theory is based on Forster's (2003) theory of character. There are two types of character: round character and flat character. A flat character is formed in a single quality or form. In the reader's mind, they remain static, as these characters are not changed by circumstances. On the other hand, a round character is a character built with complex temperaments who has the ability to surprise readers. Cassie Hanwell, the main character in the novel, can be considered a round character. This is based on her development throughout

the story. After the sexual assault and workplace gender discrimination, she becomes lonesome, paranoid, skeptical, and aggressive, while also having suppressed feelings

The fourth theory is based on the characterization theory by Murphy (1972). There are nine ways in which an author presents a character. This study applied five of the nine techniques to analyze Cassie's change of behavior after the patriarchal practices. The five techniques are character as seen by another, speech, reaction, thought, and mannerism.

There are some related studies that discuss a similar topic as this study. Firstly, an undergraduate thesis from Prawesti (2018). Prawesti's study is about feminism reflected in *Eat, Pray, Love*, a memoir written by Elizabeth Gilbert (2006). The study identified the female characters who experienced the practices of patriarchy and analyzed the practices of patriarchy the female characters experienced. It also examined Gilbert's responses toward patriarchy, which depicted feminism. This study used a feminist approach.

Secondly, Kinanti (2019) studied feminism reflected through Celeste's struggle against domestic violence in *Big Little Lies*, a novel by Liane Moriarty (2014). The first purpose of the study was to analyze the patriarchal practices that occurred in Celeste's family. The second purpose was to identify the domestic violence that she experienced. The third purpose was to identify her struggle, which depicted feminism. Similar to Prawesti, Kinanti also applied the feminist approach.

All three studies discussed earlier are mainly concerned with the oppression that the female characters experienced based on feminist perspectives. Those studies slightly differed from the current study, whose aim was to find the change in the character's personality after she experienced the patriarchal practices.

Methods

The object of this study was the novel *Things You Save in a Fire*, written by Katherine Center. The novel was published in 2019 with 29 chapters and 323 pages in total. The study used literary analysis and applied qualitative research methods

Data Analysis

The data analysis was conducted by selecting and grouping the excerpts according to the research questions. The first part of the excerpts would be about sexual assault and gender discrimination in the workplace. The second part of the excerpts was about the impacts of sexual assault and gender discrimination in the workplace.

There were several steps taken to analyze the data. First, the researcher read and reread *Things You Save in a Fire* in order to gain a deeper understanding of the content. Second, to address the research questions, the researcher analyzed the novel and selected excerpts that could be identified as practices of patriarchy with the help of Walby's (1991) theory about six patriarchy structures. Third, the researcher reread the novel and collected excerpts that showed the impacts of sexual assault and workplace gender discrimination on Cassie Hanwell's personality by applying Murphy's (1972) characterization theory. The researcher grouped Cassie's character into lonesome, paranoid, skeptical, aggressive, and suppressed feelings. Firstly, Cassie was identified as lonesome based on Murphy's (1972) technique of character as seen through her mannerisms, thought, speech, and reaction. Secondly, her becoming paranoid could be seen in her reactions, thinking, and speech. Thirdly, Cassie's becoming skeptical was analyzed in her speech. Fourthly, Cassie's aggressiveness could be observed in her thought, reactions, and speech. Lastly, Cassie's suppressed feelings were examined in her thought, speech, and reactions. In the last analysis step, the feminism theory was applied to discover the phenomenon of gender as a social construct in the novel.

Results and Discussion

This study's purposes were to offer the depiction of patriarchal practices in the novel and the impact of patriarchal practices on Cassie Hanwell. The patriarchal practices in the novel were found in the form of sexual assault and workplace gender discrimination.

Patriarchal Practices in the Form of Sexual Assault

At the beginning of the novel, Cassie Hanwell attends her award night together with the other firefighters from the Austin Fire Department. However, on that very night, when she is about to receive her award, she is sexually assaulted. Heath Thompson, the councilman and the person who gives her the award, gropes her backside on the stage.

I felt something pressing against my butt. Not just pressing against it, like I'd backed up to the podium or something. Cupping it. The only thing it could possibly be was Heath Thompson's other hand. The fact of it hit, the flashbulb popped, and then that hand gave my butt-cheek a bold, entitled, proprietary squeeze. (Center, 2019, p. 17)

Cassie states explicitly that she feels Heath Thompson's hand on her bottom, specifically a squeeze. Cassie also describes it as "bold," "entitled," and "proprietary" which means the act is not a coincidence but on purpose. Therefore, this act is considered sexual assault. Later, Cassie finds that DeStasio, her co-worker has filed a false report against her, and she confronts him. During her confrontation, she confesses that she was sexually assaulted on her 16th birthday by Heath Thompson, her former school crush.

Cassie also told DeStasio that Heath Thompson invited her to a party at his house. When Cassie arrived at his house, he draped his arms on her for the rest of the night. Later, Heath gave Cassie cups of spiked punch, a tropical alcoholic drink. Cassie became dizzy after taking the alcoholic drink, so Heath promised to take her home. However, instead of taking her home, Heath steered her out behind his garage and pushed her down into the mud. Cassie

tried to get away, but Heath grabbed her hair and tilted her head back to the point Cassie thought he might break her neck.

He pushes her face down so it's half buried in the mud. Mud fills her nose and her mouth and her eyes as he stops laughing and gets to work. She could have suffocated in that mud, for all he noticed or cared. (Center, 2019, p. 274)

Cassie explicitly states that it was while she is being held down, with her face buried in the mud, that Heath forced himself on her. Patriarchy perceives men as superior to women and women are considered part of men's property (Walby, 1991). The way Heath treats Cassie in this scene reflects Walby's theory.

According to Walby's theory, one of the six structures of patriarchal practices is male violence. It includes rape, sexual assault, wife-beating, and child sexual abuse. In the excerpts above, it can be seen that Heath Thompson considers Cassie as property. He sexually assaults Cassie Hanwell, first, when she is 16 and, second, on stage. Heath's audacity to sexually assault Cassie Hanwell for the second time in public shows that he has no respect nor fear for the consequences of his crime. His action could be considered a patriarchal practice as it reflects one of Walby's (1991) patriarchal structures in male violence structure, which covers rape.

Patriarchal Practice in the Form of Workplace Gender Discrimination

Another finding related to the first research question was workplace gender discrimination. On the night of the second sexual assault incident, Cassie attacks Heath Thompson, her sexual assailant. As a result, Cassie needs to move to another fire department. Captain Harris, the female captain in her former fire department, reminds her that she will face unfair treatment in her new fire department as a woman. In connection to Butler's (1988) theory of gender performativity, Cassie's becoming a firefighter shows that gender is performative. Gender is not an inherent identity but obtained from what we do day-to-day.

Cassie as a woman is able to work as a firefighter, a job that is traditionally viewed as a job for men because it associates with masculine traits such as stamina and strength. Her occupation here shows that she defies the gender stereotype. “All to say, I made sure he was totally sold on you before I broke the bad news.’ ‘The bad news?’ she shrugged, like, Duh. ‘That you’re a female” (Center, 2019, p. 43).

Captain Harris also tells Cassie that her soon-to-be captain in the new fire department, Captain Murphy, considers women the worst, and they originally would not hire a woman to be a firefighter if they were not desperate for recruits. On the telephone, Captain Murphy says, “Women are the worst” while talking to Captain Harris, a woman herself (Center, 2019, p. 43). From that scene, it can be seen that Captain Murphy does not care that he sounds sexist and discriminative; he even blatantly shows his discriminative belief as he is talking to Captain Harris who is a woman. Later, Captain Murphy admits that they will take Cassie to their fire department as they have been desperate for recruits, yet he does it in a belittling manner. Captain Murphy claims that he would take any person with experience and a pulse, even a woman. It can be inferred that Captain Murphy does not view men and women as equal beings. He thinks women are worth less than men.

Cassie’s new workplace is further emphasized to be a discriminative workplace when Captain Harris tells Cassie that she needs to write down some advice that will help her survive there. The first piece of advice that Harris gives Cassie is to not expect her new coworkers to like her, as they have disliked her even before they meet her. The captain also warns her that she may be ignored and excluded in her new workplace. Captain Harris tells Cassie that she might be seen as someone who tries to infiltrate and dismantle the brotherhood. Another practice of discrimination can also be found in the climax of the story when all the firefighters are on a mission at a burning grocery store. Cassie is grouped with Rookie and DeStasio. During their shift, DeStasio hallucinates, seeing a boy inside the building. The building is in

flames and the three of them are not allowed to go inside without orders from the captain. Cassie and Rookie do not see the boy that DeStasio claims to see. However, DeStasio insists on going inside and invites Rookie to come. Cassie has asserted multiple times that it is the wrong thing to do, but DeStasio keeps insisting. “‘I told you to stay put,’ I said. ‘I don’t take orders from women,’ DeStasio said. (Center, 2019, p. 244).

The three of them eventually find out that there is no boy in the building, and that DeStasio has been hallucinating. Cassie claims that she has told DeStasio to stay put, implying that he should have followed her. However, DeStasio replies that he does not take orders from women. This shows how sexist DeStasio is: he ignores Cassie's suggestion merely because she is a woman.

Another structure of patriarchy is paid work, which refers to the situation that segregates women from skilled jobs. Women and men typically do not work in the same job or industries; there is a gender division in terms of employment. Women may be skilled in the technical sense of the work, but they are not likely to get it recognized in terms of grading. Women's skills, or human capital, are more likely than men's to go unrecognized because of the different amounts of power between female and male workers (Walby, 1991). This can be seen through Cassie’s new captain, Murphy, and her coworkers' treatment of her. In her new workplace, Cassie is underestimated and her coworkers are also dismissive of her opinion. Even in the midst of critical times that risk the lives of others, her coworker, DeStasio, refuses to listen to her.

As stated by Butler (1990), every gender has a different role and the role has been established by society. Those who do not comply with the norm are punished. In this case, Cassie Hanwell chooses a role, a firefighter, that is not for women but for men. As a result, Cassie is considered someone who disrupts social control, the norm. Therefore, people discriminate against her as a form of punishment.

Impacts of Patriarchal Practices - Becoming Lonesome

In the first chapter, Cassie's former coworker, Hernandez, asks Cassie to go out with him, but she refuses as she thinks it would be awkward since they work together. Hernandez adds that she has been living like a nun. Hernandez is one of Cassie's close friends in the fire department. This means that Hernandez knows her well. "'You need to stop living like a nun,' he said. 'What if I'm the cure for all your loneliness?' That got my attention." (Center, 2019, p. 8.).

Murphy (1972) stated that authors describe a character through mannerisms or habits. Correspondingly, the excerpt above shows that Cassie has a mannerism of a nun, that is, living in celibacy. The conversation above implies that Cassie has been living alone. "'I'm not lonely.' He frowned like I was certifiably insane. 'Guess what? You're the loneliest person I know'" (Center, 2019, p. 8.).

After being told that she is a lonely person, Cassie's initial reaction is to reject that idea. From her speech, it can be seen that Cassie denies that she is a lonely person. However, the next excerpt shows that Hernandez, as her friend, sees Cassie as the loneliest person he knows. In the novel, he points out how she has never dated anyone. He also suggests that she needs a human connection. "Maybe I was lonelier than I'd realized. Maybe I did need something more. Maybe nothing in my life was quite what I thought" (Center, 2019, p. 10).

According to Murphy (1972), a character's personality can be seen from their thoughts. In this excerpt, Cassie's inner thoughts show her belief. Cassie, who initially denies the fact that she has been companionless and lonely, starts to realize that it might be true.

The cause of her becoming a loner is confirmed in a later chapter. Cassie becomes closer with the new recruit, Owen, who is also called Rookie. However, instead of building a relationship with him, she pushes him away. Cassie fights against her feelings and avoids

Owen. Noticing her distant behavior, Owen asks if someone has hurt Cassie in the past and if it makes her push him away.

“So. Did somebody hurt you?” My first idea was to say some tough-guy thing, like, “Please.” But that wasn’t going to work, because there were already tears on my face. I’d already answered his question. So, very slowly, I just nodded. “Was it a guy?” I nodded again. “Was it bad?” I nodded again. (Center, 2019, p. 223)

This excerpt shows Cassie’s thoughts and her reaction, it can be inferred that her withdrawal behavior is caused by a painful experience. She is tearing up while being questioned by Rookie. She cannot even answer it with a speech but only gives a nod. As Rookie presses for further explanation, she reveals that the painful experience is caused by a guy. From here, it can be inferred that it is the sexual assault that Cassie experienced when she was 16. As reported by Haskell and Randall (2019), the tendency to isolate oneself is one of the possible impacts of the sexual assault experience. The sexual assault makes Cassie traumatized and reluctant to open up or become close with anyone. Since her trauma, Cassie thinks that people are dangerous, and she might get hurt once she becomes close to someone.

Impacts of Patriarchal Practices - Becoming Skeptical

In chapter seven, Cassie is having a conversation with her mother when she is suddenly asked about her dating life. Her mother believes that people need a connection with others. However, Cassie has an opposing belief. Cassie confesses she has never become close with anyone, much less fallen in love. “How do you have conversations? Get to know each other? Fall in love?” ‘I told you,’ I said. ‘I don’t fall in love.’ ‘Surely you do, a little bit.’ ‘Nope,’ I said” (Center, 2019, p. 62).

From the conversation above, Cassie explicitly states that she does not fall in love with anyone. Cassie’s mother keeps pressing for more stories of Cassie’s dating life. She

eventually asks about Cassie's relationship with Heath Thompson, her former high school crush.

“Nothing ever happened with him.” She responded slowly, like she somehow knew I was lying. “Oh,” she said. “That’s too bad.” “Not really,” I said. “He turned out to be a dick.” The language made her blink. “Did he?” she said.

(Center, 2019, p. 64)

Cassie tells her mother that nothing has happened between them, and that, in fact, he turned out to be a bad person. However, Cassie does not tell the real event that happened between her and Heath Thompson. She simply tells her mother that nothing happened between them.

“I feel sad for all the women out there dragging their boyfriends to Bed Bath & Beyond and making them shop for throw pillows. They want the fantasy more than they want the truth.” “What’s the truth?” she challenged. “The truth is that love doesn’t exist.” (Center, 2019, p. 65)

Cassie's mother keeps trying to convince her that love exists and is not like what Cassie imagines. However, she still holds the same belief that is based on her past experience. She becomes not only a loner but also skeptical of having relationships. Cassie's attitude regarding relationships tends to be skeptical rather than critical. She doubts the belief of others, in this case, her mother. However, she does not apply the same skepticism or questions to her own belief. Her bad past with Heath Thompson makes her traumatized and unable to see that she still has the opportunity to be in a good relationship. This also reflects the report published by the Department of Justice Canada (Haskell & Randall, 2019) which mentioned feelings of betrayal and detachment and a tendency to minimize experience as a way of coping as a result of sexual assault. Her younger self was betrayed by the sexual assault event.

Therefore, Cassie diminishes her feelings and denies the possibility of love as a way to cope with her traumatic experience.

Impacts of Patriarchal Practices - Becoming Paranoid

In the novel, Cassie is described as a paranoid person. She is constantly on guard and easily startled by her surroundings. This can be seen through the scenes when she is startled by her coworkers and reacts in self-defense. In chapter ten, Cassie is about to fall asleep but is awakened by the loud noise of firefighters hollering and bursting through the storage closet door: “I should have expected them. I did expect them. But they scared the hell out of me anyway. In response, I shouted and launched up into a jiu-jitsu crouch on top of my mattress” (Center, 2019, p. 81).

In relation to Murphy’s (1972) theory, a character’s reaction is one of the ways authors describe their personality. The passage above shows that Cassie is startled by the crew and reacts by posing in a jiu-jitsu crouch as a way to protect herself. Her thoughts also show that she has expected them, but she could not help overreacting because of her fear. Seeing her unexpected reaction, all of the guys freeze in surprise. This incident happens more than once. In chapter fifteen, Cassie is once again startled and reacts in self-defense mode when Owen approaches her after she falls asleep on the rooftop. As a result, she accidentally kicks Owen (Center, 2019, p. 127). As reported by Haskell and Randall (2019), hyper-alertness or hyper-vigilance is one of the impacts of sexual assault trauma.

“I had lots of nightmares. But I didn’t usually have them on shift. In this one, I dreamed I was suffocating. I must have stopped breathing during the worst of it, because when I woke up, there in my storage-closet bed at the station, I was gasping for air and nauseated—as if I really had been suffocating.” (Center, 2019, p. 119)

In connection to Cassie's jittery behavior, she experiences recurrent nightmares in her sleep. Her thought process above shows that in her nightmare, Cassie is suffocating. This connects to what happened during her sexual assault. Cassie's face was planted in the mud while she was assaulted. She also feels she is suffocating that night.

As soon as she wakes up from that dream, she goes to the kitchen and gets herself a glass of water. In the kitchen, she finds Rookie. Rookie asks what happens in her nightmares. She tells him that she is always being strangled, chased, or suffocated. There are times when all three things happen together in a nightmare.

“Just since I was sixteen.” “Why sixteen? I could have shrugged, like I didn't know. Instead, I said, “That was the year my mother left.” It wasn't the whole story, but it was more than I'd ever confessed to anybody else. (Center, 2019, p. 121)

Cassie explicitly tells Rookie that her nightmares have happened since she turned 16 years old. However, as he presses for the real cause, she deflects and tells him it is because her mother abandons her instead. However, Cassie herself knows that the cause of her nightmare is the sexual assault. From these excerpts, it can be concluded that Cassie's paranoia is caused by the sexual assault she experienced.

Impacts of Patriarchal Practices - Becoming Aggressive

Cassie is furious when she is sexually assaulted for the second time by Heath Thompson. She instantly attacks Heath when she realizes he is groping her bottom: “And I lost it. Given everything, it's a miracle I didn't literally kill him. There was nothing else I could possibly have done. I turned and whomped Heath Thompson on the head with my oak-and-metal plaque so hard” (Center, 2019, p. 17).

Based on Cassie's reaction in the excerpt above, it can be seen that she loses control by the time Heath touches her bottom. From her inner thoughts, it can be concluded that she is extremely furious.

I landed a punch to the face, a knuckle strike to the windpipe, and at least one jab to the solar plexus before adding a few good kicks to the ribs with my pumps after he hit the floor. Nobody saw it coming, not even me. (Center, 2019, p. 20)

The line above shows Cassie's extreme reaction. It also implies that there is an imprint of trauma left on Cassie. Cassie has an anger outburst when she faces her sexual assailant, Heath Thompson, and she attacks him violently. The fact that Cassie herself does not see it (her attack) coming shows that this is not something she usually does. According to the American Psychological Association (2017), traumatic events that include sexual violence, war, natural disasters, and accidents can result in harmful consequences. The majority of survivors experience long-lasting problems which include anxiety, fear, shame, anger, and aggression.

"I don't remember this part, but according to Hernandez, the whole time, I was shouting, 'Touch me again, douchebag! Touch me again and see how long you live!'" (Center, 2019, p. 20). The excerpt above shows that while attacking Heath Thompson, Cassie is also shouting and calling him names. From Cassie's speech and reaction, it can be seen clearly that the sexual assault triggered her and made her aggressive. In relation to Butler's (1988) theory about gender performativity, Cassie shows that gender is not an inherent identity but a social construct. In the novel, Cassie's becoming aggressive shows that she exhibits a personality trait that is stereotypically considered to be masculine. It can be inferred that becoming aggressive is not a trait that exclusively belongs to men. It is also possible for a woman to have the aggressive trait.

Impacts of Patriarchal Practices - Having Suppressed Feelings

Before Cassie moved to the Lillian Fire Department, her captain had warned her not to develop feelings for or relationships with a fellow firefighter. Her captain explains it might make her lose her job, and not the other guy, as she is a woman (Center, 2019, p. 48). Despite her attempt to stay celibate, Cassie slowly develops feelings for Owen, but she does not show it.

“It must have made you so angry. You’re there to do a job—and you’ve got this house full of guys who underestimate you like every minute of the day—and the last thing you need is some rookie mooning over you.” (Center, 2019, p. 93)

One day, Owen confesses his feelings to Cassie without knowing that Cassie also shares similar feelings. From his speech, it can be inferred that Cassie is serious about her job. Rookie’s speech also confirms that the firefighters in the Lilian Department have been underestimating Cassie. “Can you imagine the guys? If they even suspected—even if you didn’t condone it or even know—they’d give you endless shit about it. They’d make the firehouse a living hell.” (Center, 2019, p. 93).

As Rookie continues to talk, it can be inferred that Rookie as a man himself can see how Cassie’s coworkers will give her a hard time if they are romantically involved. Despite knowing Rookie’s feelings for her, Cassie still does not confess her feelings for him. Cassie, who gets underestimated by her coworkers for being a female firefighter, might have her job jeopardized if she is romantically involved with Rookie. As a result, she has to suppress her feelings for Rookie. She tries to avoid Rookie and volunteers when coworkers want to prank him: “Whatever the guys needed done, I did it. I volunteered. I thought it would separate us. I thought, at the very least, it would annoy the rookie and discourage him” (Center, 2019, p. 111).

This passage shows Cassie's thoughts about her relationship with Owen. Cassie is trying hard to separate herself from Rookie despite their feelings for each other. She even goes the extra mile to volunteer for any kind of pranks that the crew initiates just so they will not be suspicious of her and Rookie. However, before the first sexual assault from Heath Thompson, Cassie was able to express her romantic feelings to Heath Thompson. After the sexual assault, Cassie stopped dating anyone and becomes unable to express her romantic feelings to Owen. As stated by American Psychological Association (2017), many survivors who experience traumatic events might experience nightmares, insomnia, somatic disturbances, difficulty with intimate relationships, and loss of trust. From here, the researcher concludes that the sexual assault Cassie has experienced makes her traumatized and it becomes difficult for her to be involved in a relationship.

Later in the novel, Owen is hospitalized and kept in the ICU. Cassie is prohibited from seeing him as she is assumed to be the one who caused his injuries. Finally, Cassie confesses to the captain that she loves Owen, with the hopes that he will let her see him. She also confesses that she has never told Owen or the crew about her feelings.

“He's the person who makes everything else matter. But I never told him that. I was afraid of losing my job. Or of losing the guys' respect. I know what you all think, that love is weakness.” The captain closed his eyes and shook his head.

(Center, 2019, p. 257)

In the passage above, Cassie explicitly states that she fears reciprocating Owen's feelings will result in losing the crew's respect and losing her job at the Lillian Fire Department. By analyzing the captain's reaction, it can be inferred that he disapproves and is not pleased with Cassie's confession.

“I need to see him,” I said, my voice starting to crumble. “Oh, no,” the captain said. “Do not cry.” “I'm not crying,” I said, as I wiped my face. “Women,” the

captain said, taking in the sight of me, shaking his head. “This is what I’m saying.” (Center, 2019, p. 258)

In the novel, Cassie’s confession to Captain Murphy does not change his mind to allow her to see Owen. Cassie eventually breaks down and cries in front of the captain. Seeing her desperation and tears, the captain chides her with the word “women” and implies that he has predicted that this would eventually happen. Here, Captain Murphy is stigmatizing Cassie. Crying is often equated to weakness and women. Captain Murphy’s comment implies that he believes Cassie is crying because she is the weaker gender, not because of the unfortunate event that she has gone through.

Ever since Cassie arrived at her new workplace, the crew has underestimated Cassie’s competency as a female firefighter. Furthermore, being involved in romantic relationships with the other firefighters risks her losing the crew’s respect and her job. From these events, it can be concluded that the crew’s discriminatory treatment of Cassie and her sexual assault experience makes her suppress her feelings toward Owen.

Conclusion

Cassie Hanwell, a firefighter from Austin Fire Department who later moves to Lillian Fire Department, has experienced patriarchal practices and their negative impacts on herself. The patriarchal practices that she experiences are sexual assault and gender discrimination in the workplace. Cassie Hanwell is sexually assaulted at the age of 16 by her former high school crush, Heath Thompson, after being given spiked punch, a tropical alcoholic drink. Ten years later, Cassie once again experiences sexual assault, and it is also perpetrated by Heath Thompson. She is groped by Heath on stage while receiving her award.

Inevitably, there are negative impacts that Cassie has to endure. After the events of the sexual assault, Cassie becomes lonesome and skeptical of relationships. Furthermore, she also

becomes a paranoid person and experiences recurring nightmares. Lastly, the sexual assault incident makes her become aggressive.

The other form of patriarchal practice that Cassie Hanwell has to struggle against is gender discrimination in the workplace. She is constantly underestimated, doubted, and treated unfairly by her male co-workers. The belief that women are inferior beings puts Cassie in a disadvantageous situation in her new workplace. As a result of the sexual assault and discrimination, Cassie has to suppress her feelings to protect herself and prevent being terminated from her job. This situation reflects the theory from Butler (1990) that gender is socially constructed, that it is not an inherent identity and that those who do not comply with the norm will be punished. In Cassie's case, she is a woman who defies the stereotype that being a firefighter is only a man's job. Moreover, she is also someone who rebels against the traditional norm because of her profession as a firefighter. As a consequence, the people around her, her coworkers, and the captain discriminate against her as a form of punishment.

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Translation Strategy and Terms of Acceptability in a *Dungeons and Dragons*

Translation

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Abstract

Gaming has become increasingly popular in the past few years, with many games originating in foreign countries bringing unfamiliar terms within them. With their global releases, a game would usually come with localized terms which are sometimes inaccurate and leave the players scratching their heads in confusion. This study examines the acceptability of translation containing fantasy and gaming terms in the translation of "Dungeons and Dragons" and identifies the difficulties which arose from the interpretation of the unfamiliar terms. The study used two theoretical frameworks to answer the research questions; the first one was Cortales' (2012) translation strategies, and the second was Nababan et al. (2012) acceptability assessment. The strategy employed aimed to observe the subject from several angles. The local translation from the narrator (Dungeon Master) was examined alongside the interpretation and their acceptability. The data was collected in three steps. The first one was recording and observing a session of gameplay of Dungeons and Dragons. The second step was to interview the player discussing their translation strategy as well as the results of their translation. The last step was to hand out a translation acceptability questionnaire to the players which they then filled out. The data collected was analyzed based on the theories and concluded to synthesize the overall research process.

Keywords: acceptability, gaming; guidelines, localization model, tabletop games

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Translation Strategy and Terms of Acceptability in a *Dungeons and Dragons*

Translation

Playing games can be considered one form of entertainment that goes way back in history. The history of games can be traced to their earliest form in the pre-historic era. In particular, traces of early board games were found by historians dating back to 5000 BCE with the finding of the oldest gaming token in Turkey (Lorenzi, 2013). Other early forms of board games that have been discovered are ball games, dice games, bear games, tic-tac-toe, and others that resemble checkers. In general, there were many other forms of board games originating from various countries around the world.

Throughout history, various other board games began to emerge even up to this modern time. Nowadays board games are commonly associated with snake and ladders, monopoly, chess, etc. In this current study, we refer to a particular board game known as *Dungeons and Dragons*, which was first published in 1974. Commonly abbreviated as D&D, this board game is categorized as a tabletop role-playing game with fantasy as its genre.

Dungeons and Dragons is an open-ended role-playing game, typically played by a group of players. It is open-ended in the sense of giving the players the freedom to approach any situation that they encounter. There is no limit to how many players can play this game. However, the game mostly consists of four to five players. One player takes on the role of Dungeon Master (DM), while the other players create and control a single fictional character that represents them inside the game. Essentially the players face a certain objective to complete. This is where the role of a Dungeon Master comes in. The DM serves as a referee and storyteller who explains the story and the goal and the rules of the game. The players take turns working together as a group to achieve the objective.

Since *Dungeons and Dragons* was developed by American board game designers, it inherently brought various English terminologies that necessitate the players to have the

sufficient background knowledge to play the game. This would not be a problem for native English speakers as players of the game; however, it can be problematic for non-English speaking players. This issue becomes elevated especially when the players are faced with certain terminologies in the source language that have little to no translation equivalence in the target language. These certain terminologies can be referred to as unfamiliar terminologies due to their lack of use in day-to-day conversation. Additionally, these terminologies are designed for the fantasy genre. For example, the term "magic missile" is commonly found when playing the game, which has almost no translation equivalence in the target language, which is Bahasa Indonesia.

This issue of having little to no translation equivalence imposes several challenges on the players that affect their overall experience when playing the game. The challenges range from miscommunication between the players to disruption of the pace of the game. The players needed to explain the unfamiliar translated terms before they continue their turn. According to Hevia (2007), successful localization is categorized by how it affects the player experience by maintaining the gameplay look and feel of the original. This indicates the issue that is present in *Dungeons and Dragons*. There is a certain term that has almost no translation equivalent in the target language, therefore affecting the players' experience. In other words, successful game localization has to ensure that the translation feels natural to the players, e.g., idiomatic translation for the players to maintain the immersion of playing the game.

Considering this issue in translation, this study intended to analyze the common translation strategy employed by players when facing an unfamiliar term in *Dungeons and Dragons*. It also examined the acceptability of the translation to formulate a better solution in their translation, that can help non-English speakers to play and enjoy the game as intended. Studying translation acceptability along with common translation strategies is necessary to

reveal particular translation strategies resulting in translations that are acceptable to the players.

The current study aimed at analyzing translation acceptability as one of its focuses. According to Nababan et al. (2012), acceptability is an essential part of the translation process. Although a translation may be equivalent in terms of content and messages, the translation may get rejected by target readers if it is contrasted with the target culture, norm, or rules of the target language. For example, Ndhlovu and Botha (2017) found that most Ndebele translators resorted to using translation strategies that promoted euphemism, and those that deviated were often criticized by the target readers for disrespecting their culture. This indicates that translation acceptability is not only important but crucial to ensure that translation can be accepted by the target readers. In case of *Dungeons and Dragons*, it contains English fantasy terminologies that often do not have equivalent translations in the Indonesian language. Therefore, translation acceptability plays an important role in determining whether the translation of these fantasy terminologies is acceptable to the target readers.

This study is expected to bring academic and practical benefits in that it can be a stepping-stone for other researchers interested in studying game terms. According to Roturier and Bernal-Merino (2015), the video game industry is a fast-growing entertainment industry that has received little academic attention within the gaming industry. This study may contribute to increasing academic attention and expanding the research possibilities. Additionally, it can also be beneficial for non-English speakers who want to improve their English capability by using games as a learning medium, especially for younger generations. Findings in this study may also help the non-English speaking players by learning acceptable translations revealed from this study.

This study might as well narrow the gap in translation research, specifically in tabletop gaming due to the lack of research there. Much preceding research was geared toward studying video games.

Literature Review

Translation Strategies in Video Game Localization

According to Cortales (2012), when it comes to translating video games, there is no right or wrong. However, translators need to focus on achieving their primary objective, which is to preserve the game experience. Therefore, the objective of gaming translation according to Cortales (2012) is to transfer text from the source language to the target language in a way that does not disrupt the experience of playing the game. Achieving this objective is no easy feat considering the players need to be well-versed in the textual references of the video games. In the case of *Dungeons and Dragons* term translation, the players must first learn and study all its rules, basics, the terms used, lore, stories, etc., to have sufficient knowledge of what is expected as a player to preserve the game experience. Many translation strategies can be employed. For instance, Baker's translation taxonomy contains a list of translation strategies that participants can use, be it translating books, films, or other forms of media. Though many professional translators apply Baker's taxonomy for most of their translation work, it can be argued that the translation strategies suggested by Baker are only for the general translation, not specifically tailored for video game translation, which is different from general translation. Instead, Cortales (2012) suggested four translation strategies in video games localizations that consist *Domestication*, *No Translation*, *Transcreation*, and *Literal Translation*.

Domestication

Domestication is a strategy that emphasizes using terms and phenomena that have already existed in the target language. The domestication strategy is when one translates a text and makes changes or adaptations to it so that it does not sound alien or foreign.

According to Venuti (1995), the domestication strategy is aimed at adapting those texts to particular features and standards of the target culture. This approach can be applied to the case of *Dungeons and Dragons*. Domestication strategies are intended to keep the look and feel of the original game and transfer it from the source culture to the target locale (Cortales, 2012). An example of this strategy can be found in a graphic adventure like the classic "Monkey Island 2: LeChuck's Revenge." The main character inquires about several addresses and false answers are provided, including "Palacio de la Moncloa S/N" or "La Zarzuela." In the English version, those addresses change into "Baker Street," "10 Downing Street," or "1600 Pennsylvania Avenue," while in the Indonesian version those addresses changed into "Jalan Panjang," "Gajah Mada," or "Tanjung Duren."

Foreignization/No Translation

Foreignization is a strategy that preserves the terms and phenomena of the translated language to deliver the meaning of the text. Foreignizing translation brings a foreign sensation to the translation by eliminating the cultural values of the target culture to preserve the original meaning. There is a wide array of translation strategies for foreignization; however, the study focused more on one type of foreignization, which is no translation strategy.

According to Cortales (2012), in some levels of different localization, a game may have no localization, partial localization, and complete localization. A no translation strategy can be used by the translator at any given point of the game. The choice of not translating certain names, terms, places, or expressions is subject to a foreignization strategy. In some

cases, the game experience can be hampered if all the dialogue, names, and expressions are translated.

For example, the famous video game "Street Fighter" has its skill movement sets not translated into any language. If a special movement like *hadouken* were to be translated into English, it would turn out to be "fireball," which in Indonesian is translated to *bola api*. The expectation for the players would not be met, since the players are used to the specific term or in this case the original term of this famous fighting game.

Transcreation

A new concept defined by Mangiron (2006), transcreation is a strategy used to make a difference from canonical translation as it gives more freedom for the translator to work with the term. That said, transcreation is a free re-creation of a term without losing its meaning, but also keeps the characteristic of an effective translation (Rodriguez, 2013). Using the transcreation strategy requires more effort from the translator since the translator needs to invent new words which will fit in the target text to replace words that cannot be translated properly.

Literal Translation

This is one of the most commonly known strategies used in translation studies. A literal translation is defined as the source language grammatical constructions being converted to the nearest target language grammatical equivalence. But the lexical words are translated singularly and out of context (Newmark, 1988). In the context of *Dungeons and Dragons*, this strategy is used to translate an accepted term from the source language into the target language, where the target audience easily recognizes the translated term, therefore achieving their expectation successfully.

An example of literal translation can be found in most racing genres where some of the terms usually used are tires, brake, top speed, acceleration, and handling. They can be

translated into the Indonesian language as *ban*, *rem*, *kecepatan tertinggi*, *percepatan*, and *kendali*. The complexity found in the genre above is minimum compared to other genres like adventure or RPG games.

Translation Acceptability Assessment

To answer the second research question, an assessment is needed to measure the quality of the translation from English to Indonesia. This study used the instruments of translation quality from “Pengembangan Model Penilaian Kualitas Terjemahan”(Development of Translation Quality Assessment Mode) by Nababan et al. (2012). There are three instruments of translation quality assessment, one of which is in conjunction with this study. The reason why the researcher only focused on the translation acceptability aspect for this study was because of the time limitation to complete this study.

Determining an Unfamiliar Term

According to Farkas (2018), an unfamiliar term is a term that appears less frequently in a general context. In technical and professional communication, we are often required to introduce terms that will be unfamiliar to some or most of the audience. Similarly, in gaming, people also need to know specific gaming-related terms. For example, in *Dungeons and Dragons*, a character class can be considered an unfamiliar term due to the term appearing with less frequency in a general context than appearing in a gaming context.

Another way to determine an unfamiliar term is by matching the translation data with the features of the term. Through this strategy, one can provide a list of features to determine what words can be considered as terms in this study. To understand what can be considered a term, it is important to understand first its definition and features. Words that can be considered as terms are those that have a precise meaning in some uses or that are specifically used in certain subjects or fields, such as science, art, or this case, gaming. In other words, a term must be a certain word(s) that can only be used in a particular subject. Therefore, it can be inferred

that gaming-related terms are words that are specific to gaming as a subject. To analyze the data in this study, the translation results must first be filtered to determine whether they can be considered as terms. Non-relevant words were filtered out.

Methods

This study was a field study analyzing the translation strategy used and the translation acceptability. Field research is a qualitative data collection that aims to observe, interact, and understand people while they are in a natural environment (Misirli et al., 2014). The data was collected by observing and interviewing the participants in the field. In this study, the researcher used a live environment of people playing games to collect the data. Most of the data taken came from the observation stage.

Research Procedure

The data collection process began by setting up a game session of *Dungeons and Dragons* using the application Roll20. Since the data used in the study were primary data and genitive data, the researcher analyzed the observation stage of *Dungeons and Dragons* to examine the acceptability of the translation. Three methods of data collection were used, which were observation, interview, and questionnaire. First, the observation aimed at collecting the translation data from the participant as the basic data which were analyzed to answer the first and second research questions. Second, the interview was to determine which translation strategy from Cortales (2012) was used by the participant as their translation strategy. Lastly, a questionnaire was used to gather data from the participants to assess the translation acceptability and to support the primary data analysis. The three methods of data collection were related to one another. The observation was conducted first, followed by the interview, and then the questionnaire. The data collection steps are as follows:

1. Collect Data by Observing the Session While Playing *Dungeons and Dragons*.

The researcher conducted an observation on the research participants during a session of Dungeons and Dragons gameplay. The observation included both the Dungeon Master (Narrator) and the participants (players) of the game. The participants were then asked to play a campaign designed by the Dungeon Master. The researcher took notes on the important terms used during the gameplay.

2. Match the Data of the Observation with the Features of the Term that Has Been Prepared.

After the session had ended, the researcher then matched the data found during the gameplay with a predetermined feature of the term to confirm whether the data could be used in this research.

3. Conduct an Interview with the Participants Based on the Data that Has Been Found.

The researcher interviewed the participants of the game, including the Dungeon Master, to confirm that the translation strategy used on the data was correct.

4. Send out the Questionnaire on the Translation Acceptability to the General Audience (Excluding Participants).

The researcher created a questionnaire based on the data and their translation counterpart. This questionnaire was then given to 35 other random groups of participants to check whether they approved or disapproved of the results of the translation.

After the data had been collected, the data was then analyzed in the following steps:

1. The data were identified by matching the translation results with the features of the term.
2. The translated terms were curated according to the four translation strategies of Cortales (2012) to answer the first research question. Once the translated terms had been identified, the researcher then classified the translations according to the four

translation strategies of Cortales (2012) to find the common translation strategy applied by the users.

3. The data collected from the interview were analyzed to support the translation analysis. Points of the interview included eliciting the participants' reasoning for their choice of translation. The results of the interview were to support the translation strategies analysis.

To answer the second research question, the data collected from the questionnaire were analyzed and classified according to Nababan's translation acceptability assessment instrument. The researcher sent out a translation acceptability assessment questionnaire to the general audience. Then the general audience gave their rating to the translated terms of whether they were acceptable or not based on the indicators suggested by Nababan (2012). This method of analysis allowed the researcher to find the answer to the second research question, which was to reveal translation acceptability amongst the audience.

Research Finding

The data presented in the research finding was composed of terms that appeared during the observation stage as well as their acceptability score. There were 18 data found that had been filtered using the features of the term. The researcher tabulated the collected data as follows:

Table 1

Translation Strategy

No.	Source Language	Target Language	Translation Strategy Used	Translation Acceptability Score
1	Fighter	-	<i>Foreignization/No Translation</i>	-
2	Ranger	Pemburu	<i>Literal Translation</i>	2.29
3	Sorcerer	Penyihir	<i>Literal Translation</i>	2.69
4	Lizardfolk	Manusia Kadal	<i>Literal Translation</i>	2.51
5	Healing Potion	Ramuan Penyembuh	<i>Literal Translation</i>	2.71
6	Antitoxin	Penangkal Racun	<i>Literal Translation</i>	2.74
7	Healer's Kit	Kotak Obat-obatan	<i>Domestication</i>	2.43

8	Thieves' Tool	Alat Pencuri	<i>Literal Translation</i>	2.63
9	Hit Points	Darah	<i>Domestication</i>	2.09
10	Athletic	-	<i>Foreignization/No Translation</i>	-
11	Strength	-	<i>Foreignization/No Translation</i>	-
12	Firebolt	Bola Api	<i>Transcreation</i>	2.26
13	Rapier	-	<i>Foreignization/No Translation</i>	-
14	Javelin	Tombak	<i>Literal Translation</i>	2.31
15	Poison Spray	Semburan Racun	<i>Literal Translation</i>	2.69
16	Stealth	-	<i>Foreignization/No Translation</i>	-
17	Lay on Hand	Tangan Ajaib	<i>Transcreation</i>	1.83
18	Breath Weapon (Green)	Semburan Naga Hijau	<i>Transcreation</i>	2.20

Results and Discussion

The researcher analyzed the previous finding in the unfamiliar term “fighter.” The player of the game used the strategy of Foreignization/No Translation. The fighter was not translated from the source language to the target language. According to the player, the fighter was a well-known term that could easily be found in numerous games. However, the word itself was used as part of the conversation happening between players. Due to this reason, the player opted to use the Foreignization/No Translation strategy to describe his job title. When a translated term such as *petarung* or *pejuang* was presented to the player, the player refused to use the translated term due to the different feel. This finding was in line with Cortales’ (2012) idea that the Foreignization/No Translation feature involves preserving the foreign flavor and the translator being faithful to the source culture.

The researcher analyzed the unfamiliar term *pemburu*. The player of the game used the strategy of Literal Translation where it was shown that the *pemburu* was picked by the player as the target language (TL). According to the player’s handbook, a ranger was also known as a hunter, archer, scout, or tracker. It is an archetype associated with wilderness survival and hunting. According to Cortales (2012), this translation has no known concept in the target language and is categorized using the Literal Translation strategy. Additionally, the

translated term pemburu received a rating of 2.29 in the translation assessment questionnaire, making it an “Acceptable” translation.

Based on the data above, the researcher analyzed the previous finding in the unfamiliar term *penyihir*. Here, the player of the game chose to use Literal Translation as the translation strategy for the word “sorcerer,” transforming it into *penyihir*. According to Cambridge Dictionary, a sorcerer is a person who practices sorcery. Using Cortales' (2012) features of Literal Translation, it was determined that the source language has no known concept in the target language while using an already existing concept. Additionally, the translated term *penyihir* received a rating of 2.69 in the translation assessment questionnaire, making it an acceptable translation.

The DM chose to use Literal Translation as the translation strategy for the word “lizardfolk,” which was translated into *manusia kadal*. According to the English-Indonesian Cambridge Dictionary, the word “lizard” can be translated into *kadal*, while “folk” refers to *orang-orang*. According to the feature of the Literal Translation of Cortales (2012), the lexical words of *manusia kadal* were translated individually. The term achieved an acceptability assessment with a score of 2.51, making the term Acceptable.

For the term “healing potion,” the DM chose to translate it into the term *ramuan penyembuh* in the TL. According to the English-Indonesian Cambridge Dictionary, the word “healing” can be translated into *penyembuhan*, while “potion” can be translated into *obat* or *ramuan*. The translation strategy used by the DM can be considered Literal Translation. According to the feature of Literal Translation in Cortales (2012), the term is converting the grammatical construct of the source language to the target language. The DM picked the term *ramuan* instead of *obat* because according to the interview, he believed that *ramuan* is more suited due to the theme and the setting of the game. Additionally, according to the

acceptability assessment, the term *ramuan penyembuh* received a 2.71 rating, making it an Acceptable translation to the respondent.

The finding in “antitoxin” can be separated into two words: first the prefix “anti-,” and second the word “toxin.” According to Merriam-Webster, anti- is a prefix that means to oppose in effect or activity, while toxin can easily be translated into *racun*. The strategy used in the translated term was Literal Translation, where according to the features of Literal Translation in Cortales (2012) the morphemes of antitoxin were translated individually. Additionally, *penangkal racun* received a score of 2.74 making it an Acceptable translation to the respondent.

Another unfamiliar term was *kotak obat-obatan*. According to the description in the player’s handbook, a “healer’s kit” is a leather pouch containing bandages, salves, and splints. Looking at the feature of Domestication by Cortales (2012), the translator made an effort in adapting a source concept to an existing target concept, as well as being familiar with both source and target concept and culture. Additionally, *kotak obat-obatan* was well accepted by the respondents, giving it an average score of 2.43 and making it an Acceptable translation.

The term “thieves’ tool” was translated into *alat pencuri* using a Literal Translation strategy. According to the English-Indonesian Cambridge Dictionary, the word thieves can be translated into *pencuri*, while tool can be translated into *alat*. According to the features in Literal Translation by Cortales (2012), the term was translated individually and its grammatical construction was converted into the target language. Additionally, *alat pencuri* was well accepted by the respondents with an average score of 2.63, making it an Acceptable translation.

Regarding the unfamiliar term “hit points” in the player’s handbook character sheet, the term is used to determine the remaining points of health that the player or monster has. Looking at the features of the translated words using features of Domestication by Cortales

(2012), the translator made an effort to adapt a source concept to an existing target concept, as well as to be familiar with both source and target concept and culture. However, *darah* was not well accepted by the respondents. It received an average score of 2.09, making it an Acceptable translation.

The word “athletic” was translated using the Literal Translation strategy. According to the English-Indonesian Cambridge Dictionary, the word athletic can be translated into *atletis*. Both words sound similar and capture the essence of the meaning correctly. However, the translator was faithful to the source culture and also preserved the foreign flavor, which is in line with Cortales' (2012) features of Literal Translation.

The word “strength” was translated using the Literal Translation strategy. According to the English-Indonesian Cambridge Dictionary, the word “strength” can be translated into *kekuatan*. However, the translator was faithful to the source culture and preserved the foreign flavor of the game, which is in line with Cortales' (2012) features of Foreignization/No Translation.

Using references to observe the strategy used to translate *bola api*, according to the Player's Handbook (pp 243), “firebolt” is a magical ability in which a player “hurls a mote of fire at a creature or object within range.” Looking at the features in the translated term, firebolt is a term with no known equivalence. The participant was given the freedom to translate the term. Both of these features are present in Cortales' (2012) feature of Transcreation. Additionally, *bola api* was accepted by the respondents, receiving an average score of 2.26 and making it an Acceptable translation.

As for the word “rapier,” according to the player's handbook, it is a type of sword which has a slender yet sharp pointy edge. Looking at the feature involved in the term, the translator kept the culture of the source language, as well as preserved the foreign flavor as

much as possible, which is in line with Cortales' (2012) features of Foreignization/No Translation.

The word "javelin" was translated into *tombak* using the Literal Translation strategy. According to the Player's Handbook, a javelin is a lightweight throwable spear. Using the Literal Translation strategy and the Indonesian-English Cambridge Dictionary, the word javelin can be translated into *lembing*. The word *tombak* was chosen instead to give a more immersive feeling to the game. This method is in line with the feature of Literal translation since the lexical word was translated. Additionally, *tombak* was accepted by the respondent and given an average score of 2.31, which made it an Acceptable translation.

The word *semprotan racun* was translated from "poison" using the Literal Translation strategy. According to the Indonesian-English Cambridge Dictionary, the word poison can be translated into *racun* and the word "spray" can be translated into *semprotan*. Looking at the Literal Translation features, the translated term underwent a grammatical construction from the source language to the target language. The lexical words were translated individually which is in line with the Literal Translation strategy. Additionally, *semburan racun* was accepted by the respondents and received an average score of 2.69, making it an Acceptable translation.

According to the Indonesian-English Cambridge Dictionary, the word "stealth" can be translated into *siluman*. However, the term was used in its original source language. This feature is in line with Foreignization/No Translation since it is faithful to the source culture and preserved the foreign flavor as much as possible.

The term *tangan ajaib* was also analyzed with a reference to the Player's Handbook. "Lay on hand" is a feature in which the player's "blessed touch can heal wounds." Looking at the feature of the target language, the source language has no known equivalence with the target language. Freedom was given to the participant to translate the term and create an

entirely new concept for a nonexistent one. These features are in line with the features of Transcreation by Cortales (2012). *Tangan ajaib* appeared to be a better translation for the term as it received an average score of 1.83. Although it was the lowest score found, it was still a Quite Acceptable translation.

Lastly, similar to the previous data, *semburan naga hijau* was analyzed with reference to the Player's Handbook. "Breath Weapon (Green)" is a feature in which the player "can use their action to exhale destructive energy." This term is associated with a feature only available for the Dragonborn race. The color of the breath matches the color of the scale of the Dragonborn which gives it a special property as a poison. Looking at the feature of the target language, the source language has no known equivalence with the target language. The participant was, therefore, free to translate the term and create an entirely new concept for a nonexistent one. This was in line with the features of Transcreation by Cortales (2012). *Semburan naga hijau* was proven to be an appropriate translation for the term as it received an average score of 2.20, making it an Acceptable translation.

The strategy applied could affect the acceptability score given by the participants. The researcher argued that the Transcreation strategy was less well-received as it only reached an average acceptability score of 2.09, while the Domestication strategy was well-received due to its average acceptability score of 2.26. However, this result does not necessarily suggest that the Transcreation strategy is a less effective strategy for translating an unfamiliar term in gaming. It is because of the small sample used in this study.

Based on the finding of this research, the players tended to use the Literal Translation strategy due to their familiarity with it. It is speculated that the use of another translation strategy might have altered the intended meaning of the target language. It is also speculated that the players might prefer the Literal Translation strategy due to how the first few terms are spoken and played using said strategy.

Conclusion

The researcher analyzed 18 data taken from the Dungeons and Dragons gameplay. The researcher then filtered the terms to only include terms that were in line with the features of the term. Later, the researcher analyzed the translation strategy used by the participant according to Cortales' (2012) theory of translation strategies in video game localization. Finally, the researcher created a questionnaire using Nababan's (2012) theory of acceptability assessment from the data with modifications to determine the acceptability of translated terms. From the data, it was found that there were two Domestication strategies, five Foreignization/No Translation strategies, three Transcreation strategies, and eight Literal Translations. The average score of translation resulting in acceptability ranges from the highest score of 2.74 to the lowest of 1.83.

The Literal Translation strategy was found to be the most common translation strategy used by the participants in this research. This might occur due to the participants' tendency to translate the terms by converting grammatical constructs to the target language as well as translating the morphemes individually. The results of the translation acceptability assessment provided evidence that certain terms can be translated more effectively using certain strategies. For instance, the term that had the highest translation acceptability score was antitoxin, which was translated into penangkal racun in the target language using the Literal Translation strategy. Additionally, the second-highest acceptability score was also the result of using a Literal Translation strategy, which translated the healing potion into ramuan penyembuh. On the other hand, certain translation strategies received lower scores. In this case, the term lay on hand which was translated into tangan ajaib using the Transcreation strategy was difficult to understand. Even in the source language, the term might be an unfamiliar one outside of the gaming context, thus posing difficulties in translation. Employing the Transcreation strategy allows the translator a degree of creativity and freedom

in coming up with new words or phrases that can best deliver the original meaning in the target language. However, the translation result itself is arguably not without flaw, judging by its acceptability score. The general audience often does not have a sufficient understanding of the term in the source language. They might find it difficult to translate the term properly into the target language. Translating contextual terms, in this case, gaming terms requires a certain level of understanding in both the source language and the target language environments to determine which translation strategies can best deliver the original meaning.

After finishing this study, there are several recommendations as well as suggestions offered to build upon in future research. First, those who are interested in game translation should consider the user's cultural background which can affect the translation results. Secondly, this study hopefully can become a reference for future researchers, especially in translation studies, and assist new translators interested in gaming. One recommendation for the future researcher, when designing a translation acceptability questionnaire, is not to give the respondents the source text. It will help reduce biased data for analysis. Lastly, the researcher hoped that this research would be a useful reference for English department students who are interested in studying games.

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Problems and Strategies in Comics Translation

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Abstract

Comics are illustrated stories that have been an alternative entertainment for many people of all ages. They can be fictional stories such as myths, legends, fairy tales, science fiction, and folklore. There are two types of comics: printed comics and digital comics. Many comics are translated from the source language to the target language. The translation process should ensure that the target text language is parallel with the source text language. Occasionally there are inaccurate translations, and the original message that the author wants to convey to the reader cannot be delivered. Due to the multimodality of comics, their translation often involves more complex processes compared to that of other text types. This literature review aimed to identify what problems exist in comics translation and what solutions had been suggested to overcome the problems. The primary goals were to synthesize the existing literature describing patterns of problems and strategies in translating comics. The data was collected from thirty research reports on the translation of comics in which the source language was either English or Indonesian. The review found five categories of problems with the two most frequent strategies suggested to overcome the problems.

Keywords: comics, translation, problems, strategies

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Problems and Strategies in Comics Translation

Today, it is pretty convenient to find various kinds of entertainment. One of them is reading comics and funny illustrated stories. Reading comics can be an alternative entertainment for many people as they are now widely accessible both in printed and digital forms. Comics can attract the attention of many readers because they usually have various fictional stories such as myths, legends, fairy tales, science fiction, and folklore. Since comics originate in different countries, they are often translated into many languages to reach out to diverse audiences.

A translation process itself involves replacing a text representation in one language with an equivalent text in a second language (Bell, 1991). An inappropriate translation can hinder the delivery of the author's message to the readers (Suryawinata, 1989). The translation of comics needs special attention because it concerns not only linguistic content but also symbols and images. Altenberg and Owen (2015) state that translating comics requires consideration of all features related to the source text and the multimodality aspect. Considering the complexity of translating multimodal texts such as comics, this literature review aimed to offer insight into the process involved in comics translation by identifying the translation challenges and ways to overcome them.

This review's main purpose was to synthesize what previous research had found about problems and strategies in translating comics. Understanding the problems can make translators aware of how these problems can affect their translation results and help them convey the author's message better. The data were taken from several research reports examining the translation of comics from various genres and those addressing problems that often arise during comics translation. The review focused on examining the gap between the translation of comics from English as the source language (SL) to Indonesian as the target

language (TL) and vice versa. It discussed how the translation problems affected the results of translation.

Literature Review

Translation of texts involves problems at and above word levels. According to Baker (2011), a common difficulty that translators often have in translating a text from SL to TL at the word level is non-equivalence. The problem can arise when no word in the TL expresses the same meaning as the SL word. Baker classifies these non-equivalence problems into eleven categories. They are (a) culture-specific concepts, (b) non-lexicalized concepts, (c) semantically complex words, (d) differences in meanings of words in SL and TL, e) lack of superordinate in the TL, (f) lack of specific term/hyponym, (g) differences in physical or interpersonal perspective, (h) differences in expressive meaning, (i) differences in form, (j) differences in frequency and purpose of using specific forms, and (k) loan words in the SL (2011, pp. 18–23).

Some strategies have been suggested to overcome problems in translating comics. The current review referred to the strategies suggested by Celotti (2008) and Kaindl (2004) who agree that translators should consider the interplay between verbal and nonverbal messages in the translation of comics. Celotti states a range of strategies to be used by translators, focusing on four areas where verbal messages appear: balloons, captions, titles, and linguistic paratext, also known as verbal messages contained in pictures. Whereas Kaindl, seeing comics from the design perspective, classifies the techniques to convey meanings as ranging from linguistic elements like speech bubbles and narrative texts to typographic aspects such as pictorial representations of persons, objects, and situations.

Considering the complexity of verbal and nonverbal signs in comics, appropriate strategies are essential to address problems in comics translation. The following list combines the different translation strategies of comics suggested by Celotti and Kaindl such as

(a) Translation proper, a translation that translates the source text as it is and by following its intended purpose; (b) Non-translation, maintaining the text to be the same as the source text; (c) Functional translation, translating words from the source text to target text with functionally appropriate words; (d) Deletion, removing some parts of the text to prevent misunderstanding, while still maintaining the author’s message; (e) Shortening, abbreviating a few sentences without removing any meaning; (f) Addition, adding material in the target text, for example, by inserting footnotes to add context or a translation; and (g) Cultural adaptation, replacing culture-specific elements of the source culture with those of the target culture (Celotti, 2008, pp. 33–49; Kaindl, 2004, pp. 173–192).

Methods

This descriptive literature review discussed the existing research in comics translation involving English or Indonesian as the source or target language. Using Baker’s (2011) classification of translation problems at the word level as a point of departure, the review synthesized the patterns of problems and strategies identified in the translation of comics as reported in the reviewed research reports. The data collection and analysis employed keywords to select research reports to review. While the translation problems were clustered according to Baker’s (2011) classification, the strategies identified were discussed in light of the strategies proposed by Celotti (2008) and Kaindl (2004).

Reviewed Research Reports

There were thirty research reports on comics translation retained for the review. All the reports analyzed are presented in Table 1.

Table 1

Reviewed Research Reports on Comics Translation

Author/s (year)	Type of Publication	Article Title	Aims or research question
Adhedia (2012)	Undergraduate Thesis	Analysis of expressive interjection translation in terms of meanings, techniques, and quality	To find out what strategies the translator

Author/s (year)	Type of Publication	Article Title	Aims or research question
		assessments in <i>The Very Best Donald Duck</i> bilingual comics (17 th ed.)	uses in translating expressive interjection
Agustine (2014)	Journal article	Semantic shift in the English-Indonesian translation of the <i>Tintin</i> comic series <i>The Adventures of Tintin: The Black Island</i>	To analyze the categories of semantic shift
Assis (2016)	Journal article	The concept of fidelity in comics translation	To find out the fidelity of comics translation
Barezzi et al. (2018)	Journal article	Analysis of translation technique and translation quality of Marvel comics <i>Civil War: Whose Side Are You On? Part 1, 2</i> (Multimodal approach)	To know the translation techniques of Marvel comics
Borodo (2015)	Journal article	Multimodality, translation, and comics	To investigate the translation of comic books in the context of their multimodal nature
Delespaul (2015)	Journal article	Translating comic book dialogue, humor, and sound effects	To analyze and clarify the different strategies adopted for the Dutch translation of two works by Canadian cartoonist Bryan Lee O'Malley.
Hermawan (2013)	Journal article	Multimodality: Menafsir verbal, membaca gambar, dan memahami Teks (Multimodality: Interpreting verbal, reading pictures, and understanding text)	To describe multimodality as an "analysis procedure"
Kosiński (2015)	Undergraduate thesis	Translation techniques used in the translation of comics	To find out how to translate comics
Lestari et al. (2018)	Journal article	Translation of idioms in <i>Hayate no Gotoku</i> comic volume 36	To find out how to use strategies and procedures in translating idioms
Munoz-Luna (2019)	Journal article	The translation of onomatopoeias in comics: Linguistic and pedagogical implications	To compare and analyze three versions of <i>Garfield</i> comic strips
Macková (2012)	Undergraduate thesis	Specifics of comic translation	To describe the processes of comics translation and publication and introduce the specifics of comics translation.
Mansur & Purnamasari (2020)	Journal article	Representing onomatopoeias in the Britain comic and their translations in Indonesia	To reveal the issue of onomatopoeias found in <i>Asterix</i> comics

Author/s (year)	Type of Publication	Article Title	Aims or research question
Ningtyas (2017)	Undergraduate thesis	Pergeseran bentuk dan makna dalam terjemahan komik <i>Detective Conan</i> vol 84 dan 85 (The shift of form and meaning in the comic translation <i>Detective Conan</i> vol. 84 and 85)	To analyze the shift in form and meaning in translating
Nurmada (2019)	Journal article	Terjemahan beranotasi komik <i>Psychiatric Tales</i> karya Darryl Cunningham ke dalam bahasa Indonesia	To analyze the translation of the <i>Psychiatric Tales</i> comics
Nusanti (2011)	Undergraduate thesis	The translation quality assessment of <i>The Amazing Spiderman</i> comic published by KOMPAS	To measure the accuracy of a comic translated by KOMPAS
Octaviani (2016)	Journal article	Prosedur dan metode penerjemahan bahasa slang dalam komik <i>Crayon Shinchan</i> karya Yoshito Usui (The translation procedure and method of slang language in <i>Crayon Shinchan</i> by Yoshito Usui)	To describe the category and frequency of occurrence of slang language in comics translation
Rumlus (2017)	Journal article	Comparison analysis translation method in comic <i>Wayang Light</i> vol.1 into English version	To compare and analyze the translation methods used in translating the Comic <i>Wayang</i> (vol.1) into English
Salor & Marasligil (2013)	Journal article	Translating comics: It's not just in the bubble	To explore the characteristics of comics and the challenges and opportunities for comic translators
Santika (2015)	Journal article	The translation strategy of slang expression in comic entitled <i>The Punisher</i>	To identify the types of slang expressions in the comic <i>The Punisher</i>
Sugiarto (2016)	Undergraduate thesis	Translation method in R. Goscinny and A. Udezo's comic <i>Asterix: The Legionary</i> into Tim Pustaka Sinar Harapan's <i>Asterix: Prajurit Romawi</i>	To analyze the translation methods found in the comic of <i>Asterix: The Legionary</i>
Suryani (2013)	Undergraduate thesis	Translation techniques used in bilingual comic <i>Asterix and the Golden Sickle</i> translated into <i>Asteric Dan Sabit Emas</i>	This study aims to describe and analyze the techniques used in translating <i>Asterix and the Golden Sickle</i>
Suryoalam (2011)	Undergraduate thesis	A study of translation strategies used in comic translation of <i>Lucky Luke: The Bridge on The</i>	To find out what strategy is used in comic translation and in what

Author/s (year)	Type of Publication	Article Title	Aims or research question
		<i>Mississippi to Lucky Luke: Jembatan Mississippi</i>	situation that strategy is used
Susain (2013)	Undergraduate thesis	Methods of translation in comic novel <i>Diary of a Wimpy Kid</i> into <i>Buku Harian Wimpy</i> by Jeff Kinney	To find the method used in the translation of idioms in a comic novel
Sutrisna (2017)	Undergraduate thesis	Bentuk dan strategi penerjemahan onomatope bahasa Jepang pada komik <i>One Piece</i> (Penerjemahan) (Bentuk dan strategi penerjemahan onomatope bahasa Jepang pada komik <i>One Piece</i>)	To know the translation strategy used in translating Japanese onomatopoeia to Indonesian
Taran (2014)	Journal article	Problems in the translation of comics and cartoons	To illustrate how translators face the problems on a cultural, technical, and linguistic level
Utamayasa et al. (2017)	Journal article	Loss and gain in translation process in <i>Big Nate</i> comic strips books into Indonesian	To analyze the kinds of structural loss and gain found in the comic
Wardani (2014)	Journal article	Analysis of the untranslatability in direct-speech translation: Towards <i>Tintin in The Land of Soviets</i>	To analyze the occurrence of untranslatability in the translation of <i>Tintin</i> comics
Wisudawanto & Pratiwi (2015)	Journal article	Masalah keakuratan terjemahan tuturan karakter Spongebob dalam komik <i>Amazing Journey</i> dan terjemahannya (Problems with the accuracy of the translation of <i>Spongebob's</i> character in the <i>Amazing Journey</i> comic and its translation)	To describe the problem of accuracy of translation utterance in <i>Spongebob</i> comics
Yuliasri (2017)	Journal article	Translators' censorship in English-Indonesian translation of <i>Donald Duck</i> comics	To determine censorship through translation techniques used by translators in translating humorous texts
Yablonsky (2016)	Journal article	Text and image in translation	To investigate the relationship between text and images and their implications in the translation process.

Data Collection and Analysis

The initial data collection process began by searching for articles from various sources such as books, journal articles, newspapers, undergraduate theses, and personal documents. Subsequently, the selection of papers for the analysis was based on the inclusion and exclusion criteria and by reading the abstracts. The inclusion criteria were articles that discussed comics translation, strategies for translating comics, problems in comics translation, and challenges in comics translation. Additionally, only articles published within the last ten years were retained. The reports could be written in Indonesian or English. Those that did not meet one of those criteria were excluded from the analysis. After the process of elimination, the researcher read through the introduction and findings to ensure that the paper addressed the problems of and strategies for comic translation.

The data analysis followed the steps of (a) reading papers and note-taking each study collected, (b) summarizing the main findings of each study, (c) classifying the translation problems by comparing and contrasting the data summarized, (d) identifying relationships and contradictions between the data that have been classified by category, and (e) inferring and proposing translation strategies in light of the theoretical framework.

Results and Discussion

Translation problems arise because of the difficulties faced by the translator in translating a particular word, phrase, or sentence. Reviews of the thirty articles revealed seven problems often occurred in comics translation that could be classified into five categories. These problems were determined based on problems identified in previous studies and the problem classification of Baker (2011). These five categories of problems were (a) cultural-specific concept problems that occur because of cultural differences, (b) difficulty in lexicalizing the source-language concept in the target language because there is no equivalent word when translating SL to TL, (c) differences in expressive meaning, (d), differences in

form problems, which occur where there is no equivalent in the TL for a particular word from the SL, and (e) technical problems that occur during translation.

Table 2*Identified Problems and Source Texts*

No.	Categories – Problems	Source Texts
1	Cultural-specific concept – Multimodality – Idiom – Humor	– Assis (2016); Borodo (2015); Hermawan (2013); Mansur & Purnamasari (2020) – Lestari et al. (2018) – Yuliasri (2017)
2	Source-language concept is not lexicalized in the target language – Onomatopoeia	Delespaul (2015); Macková (2012); Salor & Marasligil (2013); Sutrisna (2017); Yablonsky (2016)
3	Differences in expressive meaning – Slang	Octaviani (2016); Santika (2015)
4	Differences in form – Equivalent	Adhedia (2012); Agustine (2014); Kosiński (2015); Ningtyas (2017); Nurmadea (2019); Nusanti (2011); Rumlus (2017); Suryani (2013); Suryoalam (2011); Susain (2013); Wardani (2014); ; Sugiarto (2016)
5	Technical problem – Space limitation	Barezzi et al. (2018); Munoz-Luna (2019); Taran (2014); Utamayasa et al. (2017); Wisudawanto & Pratiwi (2015)

Table 2 shows the problems of comics translation classified under cultural-specific concepts as multimodality, idiom, and humor. The article reviewed suggested that multimodality was a problem in translating comics. Borodo (2015) asserted that comic characters do not merely interact and communicate meanings through speech balloons, but equally importantly, through gesture, posture, eye gaze, or facial expression. For example, moving the back of the knuckles up and down the jaw a few times is an expression of boredom in French. At the same time, in Indonesia, this movement can be interpreted as kill or die. These very different meanings can cause misunderstandings when reading and make the reader unable to understand the story.

The second problem identified was the idiom. Lestari et al. (2018) revealed that if the translated text contains idioms that are not culturally equivalent to those in SL, the reader can

find it challenging to understand the translation. For instance, *buaya darat* and "crocodile tears." In Indonesian, *buaya darat* means a man who likes to play with women's feelings. This idiom arises because of the Betawi culture in Indonesia, which believes that crocodiles symbolize loyalty. If the translator does not get the context of the *buaya darat*, it can be difficult for them to find a suitable translation. "Crocodile tears" in English means someone who shows insincere sadness. The two idioms have the word crocodile, but the meaning of crocodile from the two idioms is different. If the translator cannot translate the idiom correctly into the target language, misunderstanding may occur.

The third problem was humor. Yuliasri (2017) argued that humor might be language-specific and culture-specific. It is not easy to translate humor since humor is subjective. What is funny to one person may not be funny to another.

Onomatopoeia problems can result from an SL concept that is not lexicalized in the TL. Not lexicalized in the target language here means that words from the SL sometimes do not have the right vocabulary in the TL. Salor and Marasligil stated, "Onomatopoeia is particularly difficult to translate because even if a specific sound is heard similarly by people of different cultures, it is often expressed using different consonant strings in different languages" (2013, p. 8). For instance, the onomatopoeia made while eating in English is "yum yum." In French, it is "miam miam." Onomatopoeia in comics helps readers to feel the atmosphere that occurs in comics. The comic can be dull if onomatopoeia is not translated properly.

The next problem associated with differences in expressive meaning was slang. Slang refers to a non-standard language often used by teenagers when communicating with their peers. Santika (2015) and Octaviani (2016) argued that language diversity and variation, especially slang, makes translation between two different languages difficult. Examples of Indonesian slang that are difficult to translate are the word *jayus* (not funny), *woles* (the

writing is reversed from the word slow and means relax), *unyu* (cute), and *kudet* (outdated). Mistranslation of slang can make readers misinterpret expressions and lead to uninteresting stories.

The equivalence was the most frequently mentioned problem in the reviewed articles. This problem belongs to the category of differences in form. Twelve articles stated equivalent problems occurred in translating comics. Sugiarto (2016), Agustine (2014), and Suryani (2013) said it was challenging to decide on an equivalent translation from English to Indonesian as the two languages had different systems and structures. The finding was also supported by Rumlus (2017), Ningtyas (2017), and Susain (2013). They found a complex problem often faced by translators is finding equivalents or words for objects and events that are not known in the target culture. If the translator cannot find the equivalent word from SL to TL, it can lead to miscomprehension or difficulties in understanding the storyline of the comic.

The last problem was the technical problem caused by limited space. Taran stated, “One of the most obvious problems in translating comics is the limited amount of space translators have for translating comics” (2014, p. 93). Having limited space can be a problem for the translator since the TL translation can be more extended than the SL. Spatial limitations in the text balloons require the translator to find words that fit the available space. If the translator fails to do this, the translation can cover the comic image.

Table 3

Problems and Suggested Strategies

No.	Problem	Suggested Strategies
1	Slang	– Literal translation – Borrowing
2	Humor	– Generalization – Reduction
3	Idiom	– Omission/deletion – Using an idiom of similar meaning and form

No.	Problem	Suggested Strategies
		- Using an idiom of similar meaning but dissimilar form
4	Onomatopoeia	- Omission/deletion - Borrowing/loan word - Adaptation
5	Equivalent	- Omission/deletion - Borrowing/loan word - Substitution - Literal translation - Establish equivalent - Adaptation
6	Multimodality	- Adaptation - Borrowing/loan word - Substitution
7	Space limitation	- Omission/deletion - Borrowing/loan word - Literal translation - Adaptation

Table 3 shows a summary of the problems and strategies presented in the thirty articles reviewed. From Table 3 the researcher showed how each translator in the thirty articles reviewed used a strategy in each of the problems they experienced. The following are examples of strategies used:

Example 1: Literal translation

SL: Hey, Man! Don't leave me here for the pigs!

TL: Hey, bung! Jangan meninggalkanku di sini bersama babi-babi itu!

(Santika, 2015, p. 139)

The word “pigs” here means disgusting people or unpleasant people. The literal translation strategy is used here because the word pigs has a resemblance to the meaning in TL.

Example 2: Borrowing/loan word

SL: It won't be easy, he's a pro.

TL: Itu tidak akan mudah. Dia itu pro.

(Octaviani, 2016, p. 34)

The word “pro” is borrowed from SL because pro in the sentence above is widely known by TL, especially in Indonesia, where it means professional. So borrowing is the right strategy in translating the slang in this example’s context.

Example 3: Generalization

SL: Feed the pigs!

TL: Beri makan ternaknya!

(Yuliasri, 2017, p. 110)

The word “pig” in SL is generalized to *ternaknya* because, in Indonesia, the common meat sources are chicken and beef. Therefore, the word “pigs” is translated into the word *ternaknya* to refer to animals that are kept as food sources.

Example 4: Translation by using an idiom of similar meaning and form

SL: Chicken.

TL: Pengecut.

(Suryoalam, 2011, p. 62)

The word “chicken” is translated as *pengecut*. The translator can use an idiom of the same meaning and form. The translator may use it because the word chicken is considered familiar to the TL readers and has the same meaning in the SL context. This word is also often used in the TL to make jokes.

Example 5: Translation by using an idiom of similar meaning but dissimilar form

SL: Cleaned out!

TL: Bangkrut!

(Suryoalam, 2011, p. 67)

The phrase “cleaned out” is translated into *bangkrut*. Cleaned out in this context means there is nothing anymore. So, the most appropriate word to describe in the TL is the word *bangkrut*.

Example 6: Reduction

SL: But how those termites engineered the trick is beyond me!

TL: Tapi bagaimana bisa anak-anak merencanakan tipuan ini padaku!

(Yuliasri, 2017, p. 110)

The word “termites” is translated into *anak-anak* using a reduction strategy to adjust to the TL. In TL, the actual meaning of termites, animals that eat wood, can lead to ridicule or a negative connotation.

Example 7: Adaptation

SL: Boy! Is he sensitive today?

TL: Aduh! Apakah dia sensitif hari ini?

(Adhedia, 2012, p. 14)

The word “boy” is translated as *aduh*. The word boy has many other interpretations in the SL, so it is difficult to find the right word in the TL. The translator uses the adaptation strategy and translates it into *aduh* to suit the TL reader. The word is suitable for the TL reader because the word boy in the dialogue is more directed to expressing annoyance towards the other person.

Example 8: Omission/deletion

SL: \$10 per girder brought to the surface.

TL: 10 dollar per kerangka

(Suryoalam, 2011, p. 55)

The translator omits the phrase “brought to the surface” because the word does not have an equivalent translation in the TL. If the phrase “brought to the surface” were translated, the translation would change to “10 dollar per kerangka dibawa ke permukaan,” which could confuse the TL reader.

Example 9: Substitution

SL: Scrggnrgrghjhgggbgh

TL: Alaaa, tobaaat, tobat, tobat!

(Agustine, 2014, p. 19)

The sentence above uses the substitution strategy because the translator might not find the right translation of “Scrggnrgrghjhgggbgh” for TL. So, the translator translated it into “Alaaa, tobat, tobat, tobat!” and adapted it to the context of the existing story.

Example 10: Literal translation

SL: The car shoot down the one-way street, scattering, and the traffic headed towards them, horn angrily blaring at them.

TL: Mobil itu meluncur di jalan satu arah itu, melawan arus laju kendaraan di depan mereka. Bunyi klakson mobil bersahut-sahutan. Menggemakan kemarahan para pengemudi.

(Suryoalam, 2011, p. 16)

The translator uses a literal translation of the phrase "horn angrily blaring at them" which is "menggemakan kemarahan para pengemudi." The phrase "horn angrily blaring at them" does not have a proper equivalent in the TL. The translator translates it literally to make the sentence acceptable to TL readers.

Example 11: Establish equivalent

SL: Good sickles don't grow on trees

TL: Susah mencari yang mutunya bagus

(Adhedia, 2012, p.16)

The sentence above is translated to the TL using the equivalence established because "good sickle don't grow on trees" is an expression that is difficult to find an equivalent for. It may mean that it is difficult to find a good quality thing in the target text. The translator changes the meaning of the words so the reader can understand them easily.

Conclusion

The review suggested seven problems under five categories that arise in comic translation. The problems were equivalence, multimodality, onomatopoeia, humor, slang, idiom, and space limitation. These problems are categorized into five sub-categories, namely: (a) cultural-specific concept, (b) the source-language concept is not lexicalized in the target language, (c) differences in expressive meaning, (d) differences in form, and (e) technical problems. The category of problems that most often occurs was differences in form.

The absence of equivalence most often occurs in comic translations due to the difference in structure between the source language and the target language. These differences sometimes make it difficult for translators to find the right words when translating comics. Finding the right translation also takes a long time and can hinder other translation processes. The reader may think outside of the story context or be unable to understand the storyline if the translator fails to find equivalent words from the SL to the TL.

Furthermore, considering all the problems that frequently occur, the strategies most often recommended are the borrowing and omission strategies. These strategies appear to overcome many problems effectively in comics translation. This strategy can be used to solve problems in the translation of comics, especially slang, idioms, onomatopoeia, equivalence, and space limitations. Many translators use borrowing strategies because they seem to be the most accessible, especially in today's era where English is used daily in Indonesia. If the translator uses this strategy, it can help the TL reader quickly understand the meaning of the translation.

The second common strategy is omission, which is used to minimize problems such as equivalence, onomatopoeia, idioms, and space limitations. This strategy is also convenient to use in the translation process because it only reduces words that according to the translator do not have an appropriate translation or do not affect comprehension if omitted. Besides being

easy to use, the omission strategy also helps translators reduce words that can cause misunderstandings in comic stories.

In the future, it is recommended that translators pay more attention to the translation of comics, especially those pertaining to cultural aspects. In addition to culture, translators must also determine which strategy is most appropriate to use during the comic translation process so that they can produce translations that convey the author's message.

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Mental Health Literacy from the Marind Perspective

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Abstract

This study aims to describe mental health literacy components from the perspective of the Marind people in Merauke Papua, Indonesia. The participants of this study consisted of 197 Marind people (110 men and 87 women), ranging from 12-71 years old. The method used was a survey of distributed questionnaires consisting of consent sheets, demographic data, and several open questions based on the vignette of Schizophrenia and Major Depression designed by researchers based on the conceptual framework of Jorm (2000). Data were analyzed with descriptive statistics. Participant responses were categorized into several themes according to the concept of mental health literacy. The results showed that most of the participants' responses were different from the biomedical framework in terms of symptom recognition, belief in the cause of mental disorders, and the way to seek help. Culture-based beliefs contribute greatly to the understanding of mental illness symptoms. The implications of this research can be used as an academic reference as consideration for the provision of community-based interventions that are sensitive to the culture.

Keywords: depression, Marind people, mental health literacy, schizophrenia

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Mental Health Literacy from the Marind Perspective

The gap between the increasing prevalence of mental disorders and the access to treatment is of the biggest challenges in mental health care. Some barriers have been identified such as stigma, the lack of knowledge, negative perceived values, discomfort with showing emotions, lack of access, and cultural barriers (Shea et al., 2019). Mental health literacy has been proposed as one of the efforts to fill the gap and tackle those barriers.

Mental health literacy was defined by Jorm (2000) as the knowledge and the belief about mental disorder-related recognition, management, and prevention. This concept gradually changes and develops. In this study, the authors focused on several aspects that were proposed by Reavley and Jorm (2011) including the recognition of mental disorders, the belief in the cause, the belief in self-help, and the belief in professional help, as well as public stigma.

Loo et al. (2012) conducted cross-cultural studies on mental health literacy from the UK, Hong Kong, and the Malay people's perspectives. It was found that UK people have the highest mental health literacy compared to Hong Kong and Malay people. There are also differences in help-seeking recommendations related to mental health, such as the fact that UK people tended to recommend professional help, Hong Kong people tended to rely on self-help, and Malay people referred to social support as the main resource to help. Kurihara et al. (2000) found that Balinese people have a positive attitude toward people with psychosis more than Japanese people do. Nigerians tended to have a negative attitude toward individuals with psychosis as well (Tormusa, 2015). Several studies describing mental health literacy from cultural perspectives found that every culture has its own label/recognition related to a mental health issue. The recognition was related to their belief about the cause, which also had a psychosocial and cultural factor, as well as the type of help-seeking they will refer or be able

to access for related mental disorder issues (Cuwandayani & Novianty, 2019; Fauziah & Novianty, 2019; Santoso & Novianty, 2020).

Previous research has found that there is a mental health literacy gap between developed and developing countries, with developing countries having lower mental health literacy than developed countries. This gap revealed that participants in developing countries were unable to recognize vignettes (depression and schizophrenia) using psychiatry labels, identified the causes as psychosocial factors, and instead sought help informally from friends/family, self-help, religious leaders/community leaders, and so on. It might be inferred that mental problems were not framed from a biomedical perspective in developing countries, even though there is an assumption that the age gap (between adolescents and adults) is causing a shift in mental disorder awareness, in which young people are more aware of mental problems from a biomedical perspective than adults or older individuals are (Cuwandayani & Novianty, 2019).

There are several problems in some parts of Indonesia, such as Merauke, which has limited human resources, access, and mental health care facilities. The ancestors of the Marind people were hunter-gatherers known as *peramu*, and their livelihood was based on natural resources (Boelaars, 1986). Their faith was animism, which holds that nature contains spirits (Haviland, 1988). They believed that the ancestral spirit, known as *Dema*, resides in nature and is represented by natural resources like the sun, plants, and animals. Thus, they still have clans that carry the names of and high regard for nature, particularly the land. They have a local knowledge known as Totemism, which prohibits the use of natural resources as a means of exchange, the killing of pregnant animals, and the hoarding of natural resources. Dumatubun (2002) framed the health concept via literature study for several Papuan tribes, including Marind, as abiding by all taboos, keeping a balance between nature and humans, and not disrupting or purposefully walking through sacred sites.

This study explored the Marind people's perspectives toward depression and schizophrenia vignettes related to their recognition, the belief about the cause, the belief about self-help and professional help, and stigma. Due to local knowledge, restricted access to mental health care, and other obstacles, we (authors) decided to investigate their indigenous perspective on what scientific understanding defines as a mental disorder.

Methods

Research Design

A descriptive study was employed in this study using open-ended questions which derived from several aspects of the mental health literacy concept. This study intended to collect the description related to the knowledge and belief of Marind people regarding mental disorders through depression and schizophrenia vignettes and several open-ended questions. Vignettes were created according to symptoms of major depression and schizophrenia in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V). Some expressions of symptoms were constructed like Marind people's life experiences, such as the typical hallucinations. After reading vignettes there are the following open questions to answer that will allow the participants to express their opinions and understanding of the case without limiting them to choose certain responses.

Setting and Context

The setting of this study was schools and the Marind Community in Merauke. The research was conducted in Merauke, Papua. The first author visited Merauke, especially the Marind people's living area, to be able to directly meet people who identified themselves as Marind.

Research's Instrument and Data Collection

The questionnaire consisted of two vignettes (major depression and schizophrenia) following five open-ended questions employed in this study. Vignettes were constructed

according to symptoms of Major Depression and Schizophrenia in the DSM-V. The expression symptoms in vignettes were adapted from the verbal folklore of Marind People, such as the typical hallucination or delusion. Two vignettes were validated by clinical psychologists, including the open-ended questions to explore Marind people's understanding of their knowledge and beliefs about the mental disorder that was provided in vignettes. After that, one local person translated the vignettes and the following questions into the Papuan dialect. Participants were asked to write their answers, or the first author helped them to write in case they had no ability in writing. The first author also was assisted by a research assistant from the local people.

Participant

This study was intended to collect data from Marind people, so in the selection process, the candidate's parents' background (if they identified as Marind) became the determinant to select participants. People who only lived in Merauke, or were even born in Merauke/the Marind's area, but had no lineage in the Marind people, were excluded from this study. Snowball sampling was applied in this study to collect participants. Two hundred nineteen participants were involved in this study, but 22 participants have been eliminated because their data showed they were not originally from the Marind family. After data cleaning, 197 people participated in this study, consisting of 67 participants aged 12-17 years old and 130 participants aged 18-71 years old. Demographic data was collected including gender, age, parents' race(s), educational background, and occupation. A parent's race was used to be a determinant in eliminating data. Most participants' background was an adolescent and young adult (aged 12-28 years old) who were students and descendants of the Marind Family, and almost all of them had religion.

Data Analysis

Data were initially coded to divide it into numerous themes, and then descriptive statistics were used to compute the distribution of data within each theme. There were two stages in data analysis: a) developing several themes in each aspect of mental health literacy and b) calculating the frequency of each theme in every aspect.

Results

Several themes were extracted from the data in each aspect of mental health literacy concepts, including (a) Recognition of mental disorder: correct psychiatric label, incorrect psychiatric label, and incorrect label; (b) The belief about the cause of the mental disorder: biological factor, personal factor, social factor, culture, unidentified; and (c) The type of help-seeking: formal help-seeking, semi-formal help-seeking, and informal help-seeking.

Recognition of Mental Disorder

Most participants in this study could not identify those vignettes in psychiatric labels (See Table 1). For the schizophrenia vignette, the most labels that were given by participants were spirit possession (in the local language called *magu*, *weimbanggu*, *kena suanggi*, or *disarung setan*) and having life problems or heavy thoughts. Meanwhile, for major depression vignettes, the labels given most were sadness because of loss, spirit possession, and heavy thoughts. Only 1.5% of participants answered the correct psychiatric label in the major depression vignette, whereas no one gave the correct psychiatric label in the schizophrenia vignette.

Table 1

Recognition of Mental Disorder

Themes	Major Depression Vignette (%)	Schizophrenia Vignette (%)
Correct psychiatric label	1.52	0
Incorrect psychiatric label	2.54	6.93

Themes	Major Depression Vignette (%)	Schizophrenia Vignette (%)
Incorrect label	95.94	93.07

The Belief About the Cause

Myths such as cultural norm violation, ghosts, landlord *suanggi* possession, or *guna-guna* were mostly believed by participants to be the origin of schizophrenia symptoms in the vignette. In the case of major depression vignettes, most participants felt that social factors such as intimacy relationship problems, the loss of a significant person, and workplace challenges were the source of the symptoms stated in the vignette (See Table 2).

Table 2

The Belief About the Cause

Themes	Major Depression Vignette (%)	Schizophrenia Vignette (%)
Biological Factor	3.04	6.09
Personal Factor	29.95	16.24
Social Factor	42.64	27.92
Culture	13.20	44.67
Unidentified	11.17	5.08

Types of Help-Seeking

The result of this study showed self-help was advised by 6.6% of participants for schizophrenia and 22.84% for major depression in this study. For schizophrenia and major depression, self-help recommendations include meditating, positive thinking, avoiding thinking about the problem, and taking care of the body, as well as forgetting/addressing the problem. A different point of view also pointed out that some participants also believed people with major depression (77.16%) and schizophrenia (93.40%) cannot help themselves,

which means they need to ask for help from family/friends or religious leaders, as well as do religious activities, ask for help from community/traditional leaders, or visit a doctor in the hospital.

There are several types of help-seeking. Individuals who have adequate and officially certified knowledge and skill in health care (doctor, psychologist, psychiatrist, etc.) or formal health care (hospital, primary health care, etc.) are defined as formal help-seeking. Individuals who have enough and officially approved knowledge and expertise in a specific area, but not in health care, are considered semi-formal help-seeking. On the other hand, neither definition includes informal help-seeking.

Informal help-seeking was mostly referred by participants for major depression and schizophrenia vignettes. The forms of informal help-seeking for schizophrenia included conducting a traditional ceremony which is called *apmonguap* or *mabura*, or visiting *dukun/orang pintar*. Whereas for major depression, the forms of informal help-seeking participants recommended were things such as praying, visiting *dukun*, and searching for entertainment. In both vignettes, participants recommended the forms of semi-formal help-seeking such as visiting religious leaders and community/traditional leaders.

Table 3

Types of Help-Seeking

Themes	Major Depression Vignette (%)	Schizophrenia Vignette (%)
Formal help-seeking	4.57	4.57
Semi-formal help-seeking	1.52	3.05
Informal help-seeking	93.91	92.38

Public Stigma

This aspect investigates how people with schizophrenia and major depression are perceived by the public. Participants believed people with schizophrenia and depression were

"crazy," "stressed," "useless," or "abnormal." Some of them also said that people with schizophrenia are viewed as being under the influence of spirit possession (24.37 %), whereas people with major depression will be perceived as having problems with interpersonal relationships or losing significant people (26.40 %).

Discussion

This study found out that most participants, who are Marind people, did not recognize symptoms of major depression and schizophrenia through vignettes with psychiatric labels. It turned out they have a local term for describing people with major depression and schizophrenia symptoms. Some local terms that are used in describing people with schizophrenia symptoms are *ramesaf*, *avada vetokti*, *wavia anemka*, *weimbanggu*, *yawar*, and *magu*, which mean losing one's mind, spirit possession, and crazy. Whereas some local terms for describing people with major depression are *erer naek erekmaora*, *irumbu*, *merk gawagawa*, *weimbanggu*, *wabuma*, and *etokolokombear*, which mean experiencing great sadness, missing closer family, memory loss, or having trauma.

They also tend to believe the cause of major depression is related to social factors, whereas cultural norm violations or spirit possession are the cause of schizophrenia. In terms of help-seeking, most participants would choose informal help-seeking such as family/friend support, religious leader, or traditional leader in their community. Participants recommended self-help for both situations, such as praying, religious activities, and so forth. The participants had an unfavorable perception of people with major depression and schizophrenia in the public.

The results of this study revealed that the Marind people's perceptions of mental disorder symptoms differed from the psychiatric label which belonged to the DSM-V. They are more likely to associate symptoms of major depression and schizophrenia with a cultural framework than with a biomedical one. They have their own phrase for the signs and

symptoms of mental disorders that they encounter. The way they seek to help appears to be influenced by their beliefs about the cause.

This finding confirmed research by Patel (2014) which argued there is a paradigm gap between community and psychiatry professionals in addressing the type and symptoms of mental disorders. Marind people in Merauke have limited access to mental health professionals and facilities, which appears to exacerbate this disparity. This result also supports the findings of other studies that sought to understand the meaning of health in some races in Papua, namely, the harmony between humans and nature, as well as the avoidance of violence against ancestral sites and spirits (Dumatubun, 2002). It seems aligned with findings from Kermode et al. (2010) in India, where individuals believe that the quality of human-environment relationships, rather than individual quality, determines the cause of mental disorders.

Most of the participants in this study were original members of the Marind who continue to execute communal performances/activities, such as religious practices, as seen by the first author while collecting data. This endeavor aims not just to preserve indigenous wisdom, but also to maintain the Marind people's bond. Collective culture, according to Mills and Clark (as cited in Triandis, 2001), tends to create individual actions in groups to prioritize collective aims, interdependence with others in groups, and actions by group social norms. Marind people were one of the groups that possessed collective value. This could be seen in the way they seek help, which said people with major depression and schizophrenia are unable to help themselves and require assistance from others, such as traditional leaders or healers (such as *dukun/orang pintar*).

According to Loo et al. (2012), Malay and Asian people appreciate collective value, hence they use social support as their primary resource for seeking help and making suggestions for mental disorders. Spirituality and traditional values, on the other hand,

influence their preference for obtaining aid. In developing countries, informal help-seeking was highly common; some of them believed that mental disorders were caused by spirituality or traditional beliefs and that the best way to treat the problem was to engage in religious rites or activities (Reese, 2016). The community's attitude and general belief system will have a considerable impact on help-seeking behavior (Angermeyer et al., 1999). It could be the reason why, for Marind people, the concept of belief in a cause and seeking help are dependent not only on the individual's quality and skill but also on the community's belief and competency.

There is a comparable scenario among Marind people and Indigenous peoples in Africa, as well as Aboriginal people in industrialized countries, where the culture and traditional customs were gradually and systematically overshadowed by modern values as a result of colonization and monotheistic religion (Boelaars, 1986; Corbey, 2010; Kirmayer et al., 2000; Kpanake, 2018). As a community with shared values, they adjust by prioritizing the principles of social relationships, which is equally true in the case of mental health issues.

However, the concept of mental health literacy continues to focus on mental disorders from a biomedical standpoint, which contrasts with preconceived knowledge and value in various communities and cultures. Even the term mental health literacy also focuses on mental disorders. When the construct of mental health literacy instruments is only derived from the knowledge and beliefs of developed countries, it will result in a gap when applied to the middle to low-income countries, which includes not only economic factors, but also social, political, and cultural factors.

Conclusion

There are gaps related to aspects of mental health literacy from a biomedical perspective and a cultural perspective. Certain cultures have emic viewpoints on how they recognize and classify mental disorders, the belief about the cause of the mental disorder, and

the type of help-seeking. From a western perspective (which dominantly uses a biomedical framework), the level of mental health literacy in developing countries will appear to be poor, yet there are specific cultural paradigms that need to be understood related to mental health issues.

Theoretically, we should begin to uncover local wisdom to promote mental health. Cultural competence is a crucial topic in mental health practitioner education, especially when working with clients from various cultural backgrounds. In future research, investigating the label and the cultural expression of symptoms through in-depth interviews could help practitioners develop cultural competence.

More research is needed to recognize local terms of Indigenous people for identifying their mental health states, as well as their local wisdom that could promote the improvement of their mental health. Even though the intersection of biological, personal, and social factors is the cause of mental disorders, there is still a lack of understanding of cultural aspects. Globalization, the advancement of technology, and the dissemination of knowledge have accelerated cultural interaction, and mental health practitioners should be aware of the shifting paradigm in mental health phenomena across cultures.

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The Relationship Between Stress Level and Sleep Quality of Nurses in Jakarta During the COVID-19 Pandemic

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Abstract

Coronavirus disease (Covid-19) is an infectious disease known as severe acute respiratory syndrome. The first case of Covid-19 was identified in Wuhan, China on December 31, 2019. Health workers around the world are at the forefront of handling the COVID-19 pandemic. One of the health workers who is very important in handling COVID-19 cases is a nurse. The considerable increase of Covid-19 cases makes nurses have a heavier workload, struggle, and reduced rest periods. Heavy workloads and reduced rest periods can generally increase fatigue and affect sleep quality and stress levels which negatively impact work balance. This study's objective was to determine whether there was a relationship between the stress level and the quality of sleep of nurses in Jakarta during the Covid-19 pandemic. This study used 75 samples of nurses who were actively working during the Covid-19 pandemic in Jakarta, female, and aged 20-40 years. The sampling technique was snowball sampling. Data collection was through a questionnaire distributed via a Google form. The questionnaire included questions about the characteristics of the respondents, the Perceived Stress Scale (PSS-10), and the Pittsburgh Sleep Quality Index (PSQI). The study showed that there was a relationship between stress levels and the sleep quality of nurses in Jakarta during the Covid-19 pandemic.

Keywords: pandemic, covid-19, stress, sleep, nurse

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We have no known conflicts of interest to disclose.

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The Relationship Between Stress Level and Sleep Quality of Nurses in Jakarta During the COVID-19 Pandemic

Coronavirus disease (Covid-19) is an infectious disease known as acute respiratory syndrome. The first case of Covid-19 was identified in Wuhan, China on December 31, 2019. Covid-19 has been claimed by the World Health Organization (WHO) as a Public Health Emergency of International Concern (PHEIC). The number of Covid-19 cases is increasing and progressing fast enough that this pandemic continues to expand to other countries outside the Wuhan area (International Labour Organization, 2020). Health workers in the world are at the forefront of handling the COVID-19 pandemic. One of the health workers who is very important in handling the COVID-19 case is a nurse. Nurses are some of the health workers who have the longest contact with patients as they take care of patients 24 hours a day. Therefore they have a high risk of getting infected by Covid-19 (Jusnimar, 2012; Zulmia & Mu'in, 2017).

The considerable increase in Covid-19 cases causes nurses to have a heavier workload, greater struggle, and reduced rest time. Heavy workloads and reduced rest periods can generally increase fatigue and stress levels which has a negative impact on work balance. High stress that exceeds a person's endurance can cause negative effects such as headaches, irritability, and difficulty sleeping (Persatuan Perawat Nasional Indonesia, 2020).

This psychological disorder has a broader and longer-lasting impact than physical injury, while there is much less attention to mental health (Handayani et al., 2020). Possible stress-related reactions in response to the Covid-19 pandemic could include changes in concentration, irritability, anxiety, insomnia, reduced productivity, and interpersonal conflict. This is especially true of those directly affected, such as health professionals. Stress is pressure or something that feels pressuring in someone who feels that the tension has exceeded the limit and is even difficult to deal with. This pressure can arise from within or

from outside caused by an imbalance or failure of individuals to meet their needs or wishes. When stress is controlled well, it can be a good thing. On the contrary, stress can cause health problems if it is not controlled properly. Every human being has a defense system that varies when dealing with different kinds of pressure (Sartika, 2015; Sukadiyanto, 2010; Vanchapo, 2020).

The Indonesian National Nurses Association (PPNI) in 2006 stated that survey results showed that as many as 50.9% of nurses in Indonesia experienced work stress. Nurses often feel tired, dizzy, unfriendly, and unrested due to work as well as inadequate income (Jusnimar, 2012). Stress and sleep have a fairly close relationship, where poor sleep quality can be associated with mental health, one aspect of which is stress (Persatuan Perawat Nasional Indonesia, 2020). Based on research conducted by Susanti, Kusuma, and Rosdiana (2017) at Puskesmas DAU Malang, less than half of the nurses (14) experienced moderate stress levels, whereas more than half of the nurses (19) had poor sleep quality. The study also found there was a relationship between work stress levels and the quality of sleep in nurses. Hospital nurses need to carry out effective stress management such as time management, creative problem solving, and good relaxation techniques. In addition, research from the National Institute for Occupational Safety and Health (NIOSH) conducted by Schultz and Schultz determined that nursing is a profession with a very high risk of stress (Persatuan Perawat Nasional Indonesia, 2020; Schultz & Schultz, 1994; Susanti et al., 2017). Based on the explanation above, the purpose of this study was to learn the relationship between the stress level and the quality of sleep of nurses in Jakarta during the Covid-19 pandemic.

Methodology

The study design was descriptive correlational using a cross-sectional approach. The study took place from January to February 2021. The first tool used in this study was the PSS-10 questionnaire to determine stress levels. The second questionnaire was the PSQI

questionnaire to measure sleep quality. The questionnaires were administered online to nurses in Jakarta using Google Forms.

The population in this study was all nurses in Jakarta who met the inclusion requirements. They were females aged 20-40 who were still actively working during the Covid-19 pandemic in Jakarta and willing to fill out a complete questionnaire. The sample in the study was a part or representation of the population studied by the non-probability sampling method. The Spearman Rank test was carried out on the sample to determine whether there was a correlation or relationship between stress levels and the sleep quality of nurses in Jakarta during the Covid-19 pandemic.

Results and Discussion

Distribution of Stress Levels with Respondent Characteristics

Table 1

Stress Level Frequency Distribution Based on the Characteristics of the Respondents

Respondent Characteristics	Stress Level (n=75)					
	Mild Stress		Moderate Stress		Severe Stress	
	n	%	n	%	n	%
Age						
20-30 Years Old	21	28	42	56	2	2.7
30-40 Years Old	0	0	10	13.3	0	0
Sickness History						
Doesn't Have	21	28	46	61.3	2	2.7
Does Have	0	0	6	8	0	0
Job Part						
Polyclinic	4	5.3	18	24	0	0
Inpatient	1	1.3	4	5.3	1	1.3
IGD	3	4	5	6.7	0	0
NICU	2	2.7	2	2.7	0	0
HCU	1	1.3	1	1.3	0	0
Contact Tracer Covid-19	3	4	6	8	0	0
Covid-19 Inpatient	5	6.7	5	6.7	1	1.3
Isolation Room Covid-19	1	1.3	3	4	0	0
ICU	1	1.3	5	6.7	0	0
ICU Covid-19	0	0	1	1.3	0	0
Central Surgical Installation	0	0	1	1.3	0	0
Birthing Room	0	0	1	1.3	0	0
Working Period						
<5 Years	19	25.3	36	48	2	2.7

Respondent Characteristics	Stress Level (n=75)					
	Mild Stress		Moderate Stress		Severe Stress	
	n	%	n	%	n	%
5-10 Years	2	2.7	9	12	0	0
>10 Years	0	0	7	9.3	0	0
Work Shift						
Shift 1	10	13.3	22	29.3	0	0
Shift 2	2	2.7	7	9.3	0	0
Shift 3	9	12	23	30.7	2	2.7

From the research results, most of the respondents, or 52 people (69.3%), were classified as having moderate stress, 21 people (28%) with mild stress, and two people (2.7%) with severe stress. However, in the 20-30 year age group, 42 respondents (56%) experienced moderate stress. This shows that nurses who were actively working during the Covid-19 pandemic were more likely to experience moderate stress. Nurses are at great risk in dealing with Covid-19 patients. This risk includes being infected with Covid-19, working under pressure and high stress, as well as having a long working period, and excessive workload. Sometimes, they don't even have proper training or adequate personal protective equipment. They had never faced a situation like this before, so it was necessary to have much greater mental strength and energy (Rosyanti & Hadi, 2020). A total of 46 respondents (61.3%) experienced moderate stress without any medical history. Meanwhile, six respondents (8%) experienced moderate stress accompanied by a history of illness, including five people who had a history of menstrual pain disorders and one person with a history of scoliosis. Additionally, 18 nurses (24%) who worked in the polyclinic experienced the highest level of stress during the Covid-19 pandemic. This was in line with Soep's (2012) research which showed that the work environment had a significant effect on nurses' stress.

Based on the length of work, the majority of respondents, 36 people (48%), who experienced moderate stress, were those who worked less than five years. This study is in line with Manabung et al. (2018) who found that only four respondents (6.4%) had a longer working period (longer than 15 years). This was because nurses with a longer working period

understood their work duties better and had more experience so they tended to be more resilient in dealing with the pressures in their work (Manabung et al., 2018).

According to the number of shifts, most of the respondents experienced moderate stress. These respondents were as many as 23 people (30.7%) who worked in Shift 3. Respondents working in Shift 3 had a rotational shift. For instance, nurses who work one day and get a morning shift will get an evening shift on the following day, and the day after a night shift. The frequent changes in working hours also changed their sleep patterns. This research was in line with the research conducted by Rhamdani and Wartono (2019) before the Covid-19 pandemic showing that 82% of nurses who worked in shifts experience more work stress due to irregular lifestyles compared to those who do not work in shifts.

Distribution of Sleep Quality with Respondent Characteristics

This study found that 74.7% of nurses in Jakarta who actively worked during the Covid-19 pandemic experienced poorer sleep quality compared to the 25.3% of nurses who had good sleep quality. This finding is in line with research conducted by Dimkatni et al. (2020) before the Covid-19 pandemic at the emergency department, ICU, and inpatient departments of Bitung Hospital and Budi Mulia Bitung Hospital. Their study showed that 69.7% of nurses had poor sleep quality.

However, the results of this study were different from those of research conducted by Huang et al. (2022) during the Covid-19 pandemic at Fangcang Hospital in Wuhan, China. Their study results showed that in general, the sleep quality of the nurses was good during the Covid-19 pandemic. These different results might be due to many factors affecting sleep quality. Among the most important factors affecting sleep quality were the number of patients, family support, patient trust, and perception of stress.

Table 2

Frequency Distribution of Sleep Quality Based on Respondent Characteristics

Respondent Characteristics	Sleep Quality (n=75)			
	Good		Bad	
	n	%	n	%
Age				
20-30 Years Old	17	22.7	48	64
30-40 Years Old	2	2.7	8	10.7
Sickness History				
Doesn't Have	19	25.3	50	66.7
Does Have	0	0	6	8
Job Part				
Polyclinic	6	8	16	21.3
Inpatient	1	1.3	5	6.7
IGD	2	2.7	6	8
NICU	2	2.7	2	2.7
HCU	1	1.3	1	1.3
Contact Tracer Covid-19	4	5.3	5	6.7
Covid-19 Inpatient	2	2.7	9	12
Isolation Room Covid-19	0	0	4	5.3
ICU	1	1.3	5	6.7
ICU Covid-19	0	0	1	1.3
Central Surgical Installation	0	0	1	1.3
Birthing Room	0	0	1	1.3
Working Period				
<5 Years	15	20	42	56
5-10 Years	2	2.7	9	12
>10 Years	2	2.7	5	6.7
Work Shift				
Shift 1	9	12	23	30.7
Shift 2	1	1.3	8	10.7
Shift 3	9	12	25	33.3

The high prevalence of poor sleep quality in nurses will not only impact the health of the nurses themselves but can also work performance and patient safety (Agririsky & Adiputra, 2018). According to research conducted by Triwijayanti et al. (2020), sleep problems greatly affected the performance of a nurse; therefore nurses must realize that good time management is needed so that they can adjust to the existing work schedule. This study found the quality of sleep of most respondents in the 20-30 years old group (48 nurses or 64% of the respondents) was poor. Based on the age characteristics in this study, they were of productive age or young adults with an average sleep need of between six and eight and a half hours per day. Lifestyle can interfere with sleep quality and sleep patterns of young adults, due to stress, family relationships, and social activities (Thayeb et al., 2015).

The research results showed that 50 respondents (66.7%) experienced poor sleep quality without any disease history, while six respondents (8%) experienced poor sleep quality accompanied by a disease history. Lack of sleep can have a negative effect on physical or mental health. Based on the theory, lack of sleep can interfere with several body organ systems, such as the metabolic, endocrine, and immunity systems (Deaneva et al., 2015). Based on the length of work, the respondents who had the poorest sleep quality were those who had worked less than five years (42 nurses or 56% of the respondents), whereas 15 nurses (20% of the respondents) experienced good sleep quality. Nurses with a longer working period seemed to be able to adapt well to the existing work situation so that the percentage of poor sleep quality was lower in the longer working period group (Agririsky & Adiputra, 2018). Based on the number of work shifts, most of the respondents (25 nurses or 33.3% of the respondents) who experienced poor sleep quality were those who worked in Shift 3. According to Grandjean (1988), whose research pre-dated the Covid-19 pandemic, 50-60% of shift workers experienced sleep disturbances, decreased physical health, and erratic psychological conditions as a result of various working hours or work shifts.

Relationship Between Stress and Sleep Quality

A bivariate analysis was carried out to answer the research problem of whether there was a relationship between stress and the sleep quality of nurses in Jakarta during the Covid-19 pandemic. In this study, the two dependent and independent variables studied were ordinal-ordinal data, so the bivariate analysis was carried out using the Spearman rank test with $\alpha = 0.05$.

Table 3

Cross-tabulation of Stress Level and Sleep Quality of Respondents in Jakarta During the Covid-19 Pandemic

Stress Level	Sleep Quality		Total	p-value .004	r-value .325
	Good	Bad			
Mild	10 (13.3%)	11 (14.7%)	21 (28%)		
Moderate	9 (12%)	43 (57.3%)	52 (69.3%)		
Severe	0 (0%)	2 (2.7%)	2 (2.7%)		
Total	19 (25.3%)	56 (74.7%)	75 (100%)		

Note: Primary Data 2021

Based on Table 3, which was obtained from cross-tabulation between stress level and sleep quality in this study, among 52 respondents who experienced moderate stress, 43 people (57.3%) tended to have poor sleep quality. Meanwhile, among the 21 respondents who experienced mild stress, there was only a slight difference in the number of people having poor and good sleep quality. It was found that 11 people or 14.7% of the respondents experienced poor sleep quality while 10 people or 13.3% of them had good sleep quality. This finding indicates a link between stress and the sleep quality of nurses during the Covid-19 pandemic. To test the hypothesis in this study, the correlation test was conducted with the Spearman rank test.

The results of the bivariate analysis using the Spearman rank test showed the *p*-value was 0.004. Since the *p*-value was <0.05 , H_0 is rejected and H_1 is accepted. This analysis results suggested that there was a significant relationship between stress levels and the sleep quality of nurses in Jakarta during the Covid-19 pandemic. The *r*-value of 0.325 indicated a strong unidirectional relationship suggesting that the higher the stress level, the worse the sleep quality. The results of this study were in line with research at the Dau Malang Public Health Center conducted by Susanti et al. (2017) before the Covid-19 pandemic. The research found a *p*-value of 0.000 (<0.050) indicating a relationship between the level of work stress and the quality of sleep in nurses.

Likewise, da Rocha and De Martino (2010), who conducted a study before the Covid-19 pandemic, found that there was a relationship between stress levels and the sleep quality of nurses where the p -value was 0.0026 (<0.050). It showed that stress could be a direct proportional factor positive for sleep quality, in that the higher the stress level of the nurse, the worse the quality of sleep was. Research conducted by Deng et al. (2020) before the Covid-19 pandemic evaluating the correlation between work stress and sleep quality in community nurses also showed that the higher the level of work stress, the worse the quality of sleep would be. High stress that exceeds a person's endurance can cause symptoms such as headaches, irritability, and difficulty sleeping. One of the respondents in the study stated that their sleep patterns were very disturbed during the Covid-19 pandemic, but they still performed their work to the best of their ability. Although something was difficult to live with, if they got used to it, it would become a normal thing to do. But the results of the study showed that stress levels tended to be very high accompanied by poor sleep quality, even though some were able to deal with this condition well. Everyone has a different level of stress due to the stress coping ability factor and the different emotional regulations for each person (Xiang et al., 2020).

Conclusion

This study intended to find the relationship between stress levels and the quality of sleep of nurses in Jakarta during the Covid-19 pandemic. Based on the data analysis, it can be concluded that moderate stress was the highest level of stress experienced by nurses in Jakarta during the Covid-19 pandemic. During the Covid-19 pandemic, nurses in Jakarta most frequently had poor sleep quality. The results of the bivariate analysis showed that there was a significant relationship between stress levels and the sleep quality of nurses in Jakarta during the Covid-19 pandemic.

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**Education on Nutrition and Seizure Control in Children with Cerebral Palsy
for “Mitra Ananda” Community Organization in Gunungkidul, Yogyakarta, Indonesia**

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Abstract

Persons with Cerebral Palsy (CP) have disabilities due to disorders of the musculoskeletal system that were often accompanied by various other symptoms with different degrees of severity, such as seizures, intellectual disabilities, bone deformities, learning disorders, etc. Those people have a higher risk of malnutrition and seizures, especially children with CP. Mitra Ananda is an organization of parents of persons with CP that aimed to empower families of persons with CP Gunungkidul Regency. Understanding of a problem, knowledge of the solution, and confidence to implement the solution are the keys to creating an empowered community that will later become a driving force to empower others in health issues. Education on nutrition and seizure control was delivered through presentations and discussions to the members of the Mitra Ananda Organization. Program evaluation was carried out quantitatively and qualitatively. A questionnaire for the quantitative method was developed to assess caregivers' knowledge of nutrition. The assessment results presented increased knowledge of the beneficiaries. Focus group discussions and interviews showed changes in attitudes and behavior on nutrition and seizure control. Mitra Ananda members who were also caregivers of children with CP shared the newly acquired knowledge with other members. In addition to the multiplication effect, it also creates a community that becomes a driving force to empower others.

Keywords: Cerebral Palsy, nutrition, seizures

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Introduction

Cerebral palsy is a heterogeneous disorder of movement and posture that has a wide variety of presentations, ranging from mild motor disturbance to severe total body involvement (Azar et al., 2016). Cerebral palsy was an umbrella term encompassing a group of non-progressive, noncontagious neurological conditions that cause physical and cognitive disability in human development, in which functional performance, participation, movement, strength, posture, muscle tone, sensation, vision, perception, communication, and behavior can be affected. Cerebral palsy was caused by damage to the motor control and cognitive centers of the developing brain and can occur during pregnancy (approximately 75 percent), during childbirth (approximately 5 percent), or after birth (approximately 20 percent) (Thorngren-Jerneck & Herbst, 2006). Persons with Cerebral Palsy are included in the disability category because they have disorders of the musculoskeletal system and are accompanied by various other symptoms depending on severity such as seizures, intellectual disabilities, bone deformities, learning disorders, and so on (Frontera, et al., 2018). Children with Cerebral Palsy have a higher risk of experiencing malnutrition so the needs of a person with Cerebral Palsy must be monitored in terms of their nutritional needs so that difficulties related to meeting daily nutrition can be quickly resolved (Irish Nutrition and Dietetics Institute, INDI, 2015).

Based on the 2010 Basic Health Research report by the Ministry of Health, the Research and Development Agency showed the prevalence of Cerebral Palsy in Indonesia was 0.09% in children aged 24-59 months. According to the data from the Central Statistics Agency, the percentage of malnutrition in children, especially in Gunung Kidul, was 0.53%, and malnutrition

was 6.55% (Badan Pusat Statistik, 2019). Seizures were common in children with Cerebral Palsy with rates varying from 15 percent to 60 percent (Gürkan, et al., 2018). The Central Statistics Agency found that services were still limited in relation to Cerebral Palsy in Gunung Kidul. The rapid assessment of the impact of Covid-19 on persons with disabilities and their caregivers done by the DPO national network for Inclusive Covid response (2020) showed that persons with disabilities had increased significant barriers in finding personal assistance, difficulty in accessing therapy services, reduced income, difficulties on meeting basic needs and difficulties in health services due to Covid-19 (DPO National Network for Inclusive Covid 19 Response, 2020). Efforts needed to be made to address the impact of Covid- 19 on children with Cerebral Palsy especially in addressing challenges in nutrition and seizure management.

Mitra Ananda was a subsidiary of 19 organizations under a community empowerment organization, namely Mitra Sejahtera Disability Empowerment Center (PPDMS= Pusat Pemberdayaan Disabilitas Mitra Sejahtera) located in Nglipar Village, Gunungkidul Regency. Mitra Ananda had a membership of 50 persons whose family members or children had Cerebral Palsy. From the field discussions conducted both online and offline with them (mostly the mothers of children with Cerebral Palsy), the caregivers wanted to learn and know how to meet the nutrition requirement for children with CP, symptoms that could affect the children's condition, medications advised for managing digestive system disorders. There were limited services related to Cerebral Palsy and there was no pediatrician at the nearest community health center (Puskesmas). The discussion led to an agreement to provide health education on nutrition and seizure management of children with CP for the members of Mitra Ananda.

Experimental Details

According to WHO, community empowerment enables communities to have more control over their lives (WHO, 2009). The project empowered the community by increasing the knowledge of the parents of children with cerebral palsy. The increased knowledge of fever and seizures was expected to enable the parents to have more control over what to do when their children have fever or seizures. There were five principles of community empowerment, they were community control, public sector leadership, effective relationships, improving outcomes, and accountability (Strategic Scrutiny Group, 2019). The project applied these principles, particularly the first one in which the parents of children with cerebral palsy have more control over their decision regarding their children's health condition.

The community empowerment program had the following steps:

1. Preparation step

- a) January 2021, a discussion with members of the UKDW service team was held to discuss the objectives, goals to be achieved, and the topics that would be raised on the date. After that, an online joint meeting with the chairman of the PPDMS on January 13, 2021, to get to know more closely with Mitra Ananda members was carried out.
- b) February 2021, the service team took the second stage of preparation through a field visit to obtain information and assessed real conditions in the field. Moreover, the team observed the situation as well exploring further needs of Mitra Ananda members.
- c) March 2021, the service team planned the schedules, tasks division, education materials on nutrition and seizure management, files such as attendance list and MoUs as well as transportation.

2. Implementation step: The community program was carried out starting with an introduction to caregivers of CP at Mitra Ananda and followed by health education on nutrition and seizure management for children with Cerebral Palsy.
3. Evaluation step: The evaluation methods were quantitative and qualitative.
 - a) Quantitative method: knowledge or understanding of education's participants were measured by pre and post questionnaires which have been prepared by the University service team upon consultation with them.
 - b) Qualitative method: focused groups discussion with CP caregivers at Mitra Ananda was conducted. The time gap between the health education and the second discussion was within one month.

Results and Discussion

Mitra Ananda members carried out regular meetings in which they supported each other and brought their homemade products such as salted eggs, snacks, crafts, and merchandise for selling or exchanges. However, since the spread of Covid-19, they reduced the meeting span from monthly meetings to three-monthly meetings due to Covid-19 protocols. The Covid-19 pandemic had affected community meetings (Ebrahim et al., 2020). People were forced to minimize crowd size, reduce gathering frequency and practice social distancing (Reuben et al., 2021). Some research on the community behavior of related to covid-19 reported that Indonesian people were quite disciplined to the health protocols (Yanti et al., 2020). Mitra Ananda members reduced their meeting frequency and compensated for the meeting gap by intensifying communication in the WhatsApp group.

The community service activities in the form of health education started with assessment and preparation from January – March 2021 and were followed by the implementation from

April to June 2021. The first socialization was attended not only by Mitra Ananda's members but also by the committee of 18 other organizations under PPDMS. It was initiated by explaining the program's context and objectives. During the first socialization, the socio-economic conditions of parents/caregivers were observed because the research of de Andrade (2017) revealed that the guidelines received by parents needed to be adapted to the environment and local context of each child and family.

Respiratory dysfunction is a leading cause of morbidity and mortality in individuals with cerebral palsy (CP). In children and adults with CP, movement and physical function are always affected. Children with cerebral palsy have an increased risk of sudden death during sleep (Proesmans, 2016). In particular, recurrent aspiration, impaired airway clearance, spinal and thoracic deformity, impaired lung function, poor nutritional status, and recurrent respiratory infections negatively affect respiratory status (Boel et al., 2019). In addition, we know that advanced age and pre-existing respiratory comorbidities are significant risk factors for respiratory complications from Covid-19. So, if a person with CP catches Covid-19 and develops respiratory symptoms, they should be informed that they could be at a higher risk of developing severe respiratory symptoms (Brandenburg et al., 2020).

The following educational session was in form of a group discussion, in which the University team delivered educational materials through a power-point presentation and a question and answer session. The interaction and discussion with the participants were intense. The education materials included daily nutritional intake, consequences if their nutritional needs were not met, some forms of seizures, symptoms that often accompany seizures, things to do and not do when children have seizures, and education related to eating disorders and how to reduce constipation complaints in CP children. The materials and discussion lasted for 3 hours.

Malnutrition was one of the conditions often suffered by people with CP because it increased the risk of growth failure (Sadowska et al., 2020). Eating disorders were often experienced by people with CP which affected the amount of food that could be consumed by people with CP. The eating disorders found in people with CP included the inability to feed themselves, inadequate/absent lateralization of the tongue, chewing problems, swallowing problems, coughing/choking while breastfeeding, salivation, inability to eat solid foods, constipation, vomiting/regurgitation, and inappropriate wide mouth opening (Almajwal & Alam, 2020). From the results of discussions, eating disorders were expressed by almost all caregivers (mostly mothers of children with CP). The team provided information about the selection of types, ingredients, and also the consistency of foods that could be selected to improve the nutritional status of children with CP.

Another issue that emerged in the discussion was constipation which was commonly experienced by people with CP. Based on the source, the factors that influenced constipation were prolonged immobility, the absence of an upright posture to defecate, bone changes such as scoliosis, hypotonia, dietary factors such as insufficient fiber or fluid intake, and the use of drugs as an anticonvulsant (Almajwal & Alam, 2020). In addition to the consistency and type of food, the participants were taught about gentle manual physiological manipulation steps to help reduce constipation.

Epilepsy and seizure disorders were also associated with CP. Seizures were also a risk factor for epilepsy in children with CP and it could cause further mental retardation (Sadowska et al., 2020). In a study conducted by Pavone, the use of antiepileptic drugs was more frequent in the group of paralyzed children, but with targeted treatment, 54% achieved satisfactory seizure control. In some patients, the dose of the drug had to be adjusted and some patients could

gradually reduce the dose of treatment because it showed improvement (Oliva, et al., 2021). This study showed that with regular medication education, the use of seizure medication could provide benefits for CP children with seizures.

Before and after the implementation of the education session, participants answered eight yes or no questions as shown in Table 1. Medical problems found along with motoric disability in CP patients included malnutrition/gastrointestinal disorders and epilepsy (Sadowska et al., 2020). The questions were adjusted to the objective and essential things that were the problems or issues for CP. Based on the results of the evaluation using the questionnaire, it was found that there was an increase in the average correct answer answered by the participants, initially the average score was 59% and it increased to 92%.

The second stage of the evaluation was carried out through interviews and with Focus Group Discussion (FGD) on June 13, 2021. There were 10 participants who attended this second evaluation. This interview involved individuals with a small number of respondents to explore their perspective on a particular idea, program, or situation. In this evaluation, the volunteers provoke open questions according to the topics that have been given and the participants share their experiences of things that have been successfully practiced. In addition, questions that were asked by participants during the session would be asked again and become a benchmark for assessing whether there were changes in knowledge, attitudes, and behavior of Mitra Ananda members after counseling related to nutrition and seizures for children with Cerebral Palsy.

In this second evaluation, there was a significant change which was marked by changes in both the correct answers from the participants and the enthusiasm also the confidence shown by each question given by the university team based on the educational material they have followed for 1 month previously. Some things changes were quite good, such as how to handle

when a child was having a seizure. Before attending the class, information was obtained that when a child has a seizure, oil, and a spoon was inserted into the mouth and held the child in place so as not to make excessive movements. After attending the educational session, participants understood that it was enough to just avoid dangerous objects around them and it was better not to put hard objects but soft objects such as towels into their mouths. Another example, the caregiver did not know about the rectal toucher to make the defecation process not too difficult. After the counseling and practicing with a rectal toucher to stimulate bowel movements were successful, then the method was distributed in WhatsApp groups by one of Mitra Ananda's members. Participants can understand the symptoms of seizures, the nutrition that must be met, and what to do during a seizure and not do during a seizure. There were some things that still require the implementation process, such as there were still some who have difficulty eating, were hard to sleep at night, did not enjoy eating vegetables, and only want to drink milk.

From this evaluation, information was obtained that educational materials, summaries that have been made by service members, and independent notes made by caregivers were distributed to the Whatsapp group which were downloaded by members of Mitra Ananda who did not have the opportunity to attend because participants were also limited due to pandemic. In the FGD, it was also known that in the WhatsApp group discussions, the members asked questions that would be answered by the carrier present. Knowledge was successfully applied, actively communicated in the group, and imitated by other carriers. This showed the effect of multiplication in a wider scope. Telling each other from one member to another, the knowledge gained continues to spread.

Caregivers with Cerebral Palsy face a tough task that has both physical and emotional implications. The quality of life of Caregivers was correlated well with the motoric function of CP children. It was important not only for physical health but also psychological health of carriers of CP children, especially those with severe motor function (Yun, 2017). In order to improve the quality of life for people with Cerebral Palsy and caregivers, a support system was needed. A good spirit not getting caught up in a problem should be used as an example for others who feel the same fate and share the same fate so that, from a small group of empowered people, they can become agents of change for the surroundings and the wider community.

Table 1

Pre and Post-Test Questionnaire and the Results

No.	Questions	Percentage of correct answers	
		<i>Pre-test</i>	<i>Post-test</i>
1	Children with CP need high carbo.	0%	92.90%
2	The eating position was important	86%	100%
3	Food for CP has to be fluid and very soft (less fiber)	43%	78.60%
4	Children with CP do not need fiber	100%	100%
5	Seizure to CP always above 15 minutes	50%	92.90%
6	Continued blinking eyes were not an early sign of seizure	21%	100%
7	Bone development was not important for CP	100%	100%
8	Medication for seizures must be taken more than 4 times	50%	64.30%
Average		59%	92%

Conclusion

Health education has been carried out for the caregivers at Mitra Ananda so that they can manage nutrition and seizure management for children with CP. There was a positive impact on their knowledge, enthusiasm, and commitment to supporting each other. They supported each other by teaching the other members to share their experiences and new knowledge. This has an impact on caregivers who are more confident to take the right action with first aid when a child with CP has a seizure. The knowledge gained through education aims to empower caregivers to be more independent so that they can provide appropriate first aid for children with Cerebral Palsy, especially during this pandemic where children with special needs or in this case Cerebral Palsy have a higher risk of developing severe respiratory symptoms for that knowledge through education is needed to reduce mortality. The health education material was found appropriate as it was consulted and designed with the active participation of Mitra Ananda members. Confidence and understanding of a topic that was experienced and knows how to solve problems was the goal of creating a community that becomes a driving force to empower others through health education methods.

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Non-Performing Loans' Impacts on the Banking Industries' Loan Loss Provisions

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Abstract

Non-performing loans can impact the loan loss provisions of the banking industry. This study explored the moderating effect of foreign exchange rates (USD against Rupiah) on the influence of the capital adequacy ratio and interest rates on Non-Performing Loans. The sample of this research was collected from three banks: PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk, for the period of 2013-2018. There were 72 data, 24 from each of the banks. The analysis was carried out using multiple linear regression and Sobel path analyses. The results showed that Capital Adequacy Ratio had a significant positive effect on Non-Performing Loans. Interest rates did not significantly affect Non-Performing Loans. Non-Performing Loans did not significantly affect Loan Loss Provision. Capital Adequacy Ratio had a significantly positive effect on Loan Loss Provision. Interest rates did not significantly affect Loan Loss Provision. Foreign exchange rates (USD against Rupiah) did not significantly moderate the positive effect of the Capital Adequacy Ratio on the Loan Loss Provision. USD exchange rates significantly moderated the negative effect of Non-Performing Loans on Loan Loss Provision. The interaction between the USD exchange rate and Non-Performing Loans negatively affected Loan Loss Provision. Foreign exchange rates did not significantly or positively moderate the effect of interest rates on Loan Loss Provision. Non-Performing Loans significantly mediated the positive effect of Capital Adequacy Ratio on the Loan Loss Provision. In other words, the positive effect of the Capital Adequacy Ratio on Loan Loss Provision is more positive when Non-Performing Loans increase, and vice versa. Non-Performing Loans did not significantly mediate the negative effect of interest rates on Loan Loss Provision, or the negative effect of interest rates on the Loan Loss Provision would be more negative when the Non-Performing Loans decreases, and vice versa.

Keywords: capital adequacy ratios, interest rates, non-performing loans, exchange rate

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Non-Performing Loans' Impacts on the Banking Industries' Loan Loss Provisions

Credit is a financial facility that allows a person or business entity to borrow money to buy products. In practice, credit loans are usually stated in the form of a written agreement. In this case, the institution that usually distributes large amounts of credit is in the banking sector. Therefore, banking competition, especially lending, is getting tougher. The more advanced economic development certainly brings greater opportunities and risks, and one of the risks experienced in the banking world is credit risk. Effective credit disbursement is expected to be able to support development in various economic sectors such as the infrastructure sector, consumer sector, trade sector, food and beverage industry, agribusiness sector, and Micro and Small Enterprises sector (MSEs). Some time ago, OJK (Financial Services Authority) data showed that the ratio of Non-Performing Loans (NPLs) in the banking sector increased. In October 2017, the NPL was recorded at 2.96%, an increase from the previous month which was recorded at 2.93%. The NPL ratio is obtained from the total NPL divided by the total credit (Setiawan, 2017, 2018). To anticipate credit risk due to debtor default, banks are required to establish and set aside funds to cover the risk of loss on loans extended to customers. In this case, the bank must establish a Loan Loss Provision or LLP. One of the factors affecting the Loan Loss Provision is NPL which was stated by OJK was still increasing until the first semester of 2016 banking reserves. One of the reasons was the ratio of bad loans or gross NPL before the deduction of the relatively increasing reserves (Yudistira, 2016, 2018a, 2018b, 2018c).

Non-performing loan risk is influenced by several internal factors, some of which are the capital adequacy ratio (CAR), interest rates, and external factors such as the Rupiah exchange rate (Bank Indonesia, 2015). This will be transferred to loan interest rates which will reduce the customer's ability to pay. Therefore, banks must be careful in raising loan

interest rates so that they do not affect the NPL too much. The Rupiah exchange rate continued to weaken until it penetrated the Indonesian Rupiah (IDR) of 14,000 per dollar. The continued weakening of the Rupiah could affect bank debtors in terms of payment of debt installments which in turn affects the bank's NPL (Setiawan, 2018). As with credit in foreign currency, if the Rupiah exchange rate continues to weaken, it is feared that the installments of foreign currency debtors to banks could be disrupted. Paul Sutaryono, a banking observer, stated that if this situation continues, it will increase the ratio of NPL of loans in foreign currencies (Tiatmodjo, 2017). Wen (2017) in his research shows that interest rates have a significant and positive relationship with the ratio of Non-Performing Loans to total loans. The positive impact of interest rates on NPL reflects that higher interest rates make borrowers have to work hard to repay their loans, which leads to a default rate for higher loans and vice versa.

Based on the above description of the problem and the phenomenon, this study raised the question: "Do the foreign exchange rates moderate the effect of the capital adequacy ratio, and interest rate toward Non-Performing Loans that impact bank loan loss provision?" The objectives of this research were to examine and analyze the moderating effect of foreign exchange rates and the mediating effect of Non-Performing Loans on the effect of capital adequacy ratios, and the effect of interest rates on the reserve for impairment losses in the banking industry.

Literature Review

Capital Adequacy Ratio

Capital Adequacy Ratio (CAR) is the ratio of a bank's capital with its risk-weighted assets and current liabilities. It is decided by central banks and bank regulators to prevent commercial banks from taking excess leverage and becoming insolvent in the process (What

is 'Capital Adequacy Ratio', 2021). CAR can show the condition of bank assets that can still be covered by available bank equity. The higher the CAR, the better the condition of the bank. In other words, CAR is the ratio of bank performance to capital adequacy owned by banks to support assets that contain or generate risks, such as lending. The CAR formula is stated as the ratio of bank capital to total risk-weighted assets (What is 'Capital Adequacy Ratio', 2021).

Exchange Rate

According to Case et al. (2017), the exchange rate is the ratio at which two currencies are traded. It is the price of one country's currency in terms of another country's currency or the ratio at which two currencies are traded for each other. The decline in the domestic currency exchange rate reflects the declining role of the national economy; due to increased demand for foreign currency, if the domestic currency exchange rate strengthens, the performance in the money market shows improvement. An unstable exchange rate causes uncertainty in the business world, especially those directly related to foreign trade transaction activities, both through export and import mechanisms, both for the sale of goods and services and for the supply of raw or finished materials in the country.

Interest Rate

Interest rates can be interpreted as remuneration provided by banks based on conventional principles to customers who buy or sell their products (Kasmir, 2008). Interest rates are also the price that customers have to pay to the bank. Therefore, if there is an unreasonable increase in interest rates it will make it difficult for the business world as it will increase the company's burden and directly reduce the company's profit. The company can also experience difficulties in making loan payments to the bank which results in bad credit.

In general, it can be said that lower interest rates will increase economic growth due to the increased flow of funds (Sitanggang & Munthe, 2019).

Non-Performing Loans

Ammann (2001) defines credit risk as the possibility that a contractual counterparty does not meet its obligations as stated in the contract, thereby causing the creditor a financial loss. According to Hull (2018), credit risk is the risk that counterparties in loan transactions and derivative transactions will default. Credit risk is present in all the activities of counterparties, issuers, and browsers. Credit risk arises from the possibility that loans from banks cannot be repaid because not all debtors can pay their credit installments on time; therefore there is a classification of credit collectability in banking. According to Bank Indonesia Regulation (Peraturan Bank Indonesia/PBI), PBI No. 17/11/PBI/2015, the credit risk ratio in this study is interpreted as Non-Performing Loans (problem loans) because problem loans can measure the extent to which Non-Performing Loans can be covered with a bank's productive assets. According to PBI No. 17/11/PBI/2015, the ratio of Non-Performing Loans to total loans refers to the ratio between the total number of loans with less-than-current, doubtful, and bad quality loans to total loans, and under BI regulations, a bank should keep its problem loans below 5%.

Loss Loan Provision

According to the revision of PSAK 55 of 2006, the term PPAP was changed to Loss Loan Provision (LLP) in the Indonesian language known as *Cadangan Kerugian Penurunan Nilai* and abbreviated into LLP. In the Loss Loan Provision, the formation and provision of funds are assessed from the results of the debtor's credit evaluation carried out by the bank, and usually, the results of the evaluation of the debtor's credit are based on the policy decisions of each bank in establishing reserves and credit. According to Bank Indonesia

Regulation No. 14/15/PBI/2012, the allowance for impairment losses is: “an allowance is made if the carrying amount of a financial asset after impairment is less than the initial carrying amount” (Bank Indonesia, 2012). The calculation of loan loss provision/LLP is more complicated, but the credit review can be detailed for each debtor so that credit control can be carried out effectively. The control is expected to reduce the occurrence of credit risk in banks.

Thinking Framework and Hypothesis Development

The Influence of Capital Adequacy Ratio on Non-Performing Loans

The capital adequacy ratio (CAR) is a capital ratio that shows the ability of a bank to provide funds for business development as well as for accommodating the risk of loss caused by bank operations so that CAR can show the extent to which a bank's capital capacity is to bear the risk of credit failure. The effect of the capital adequacy ratio on Non-Performing Loans is also obtained from two previous studies by Wood and Skinner (2018) in Barbados and Vatansever and Hepşen (2013), where the value of the CAR ratio has a positive influence on the value of Non-Performing Loans. The hypothesis H1 is postulated as follows:

H1: Capital Adequacy Ratio has a positive effect on the level of Non-Performing Loans.

The Influence of Interest Rates on Non-Performing Loans

Under certain conditions, a bank is required to raise interest rates. When interest rates rise, it will affect the demand for credit loans to banks and also especially affect customers who have taken credit loans. Customers find it difficult to pay credit because high-interest rates will increase the value of Non-Performing Loans. The effect of interest rates on Non-Performing Loans is also obtained from four previous studies by Wood and Skinner (2018), Adeola and Ikpesu (2017), Berti et al., (2017), and Wen (2017). The studies showed a positive

effect on the level of Non-Performing Loans. But the research results of Žiković et al. (2015) found that interest rates have mixed implications on Non-Performing Loans for both categories depending on the duration of the observation period. In the long term, a positive relationship was found between interest rates and the ratio of Non-Performing Loans. In the short term, a negative relationship was found between interest rates and the ratio of Non-Performing Loans. So that the hypothesis H2 is postulated as follows:

H2: Interest rates have a positive effect on the level of Non-Performing Loans.

The Influence of Non-Performing Loans on Loan Loss Provision

Non-Performing Loans in a bank is the value of the allowance for funds that must be made by a bank to anticipate credit risk due to debtors experiencing problems in credit payments. The effect of Non-Performing Loans on loan loss provision was also obtained from two previous studies by Lim et al. (2013), and Sitanggang and Munthe (2019) which showed positive results. Thus, the hypothesis H3 is postulated as follows:

H3: Non-Performing Loans have a positive effect on Loan Loss Provision.

The Influence of Capital Adequacy Ratio on Loan Loss Provision

The Capital Adequacy Ratio is a reflection of the company's capital. It can be interpreted that a bank that has a high CAR level already has sufficient capital to support the bank's needs and overcome the risks that arise. Every fund disbursed by a bank carries a risk of loss due to the default of the debtor for this matter. It is necessary to establish an allowance for impairment loss to maintain a bank in a stable condition. This statement is reinforced by research conducted by Yeh (2010), which states that the capital adequacy ratio has a positive effect on the loan loss provision. Based on this description, the following hypothesis H4 is postulated:

H4: Capital Adequacy Ratio has a positive effect on Loan Loss Provision.

The Influence of Interest Rate on Loan Loss Provision

The interest rate can be interpreted as the price that must be paid by the customer to the bank in the event that the customer obtains a loan. The loan loss provision is the amount of funds that must be prepared by a bank to face losses in the event of bad credit. Lim et al. (2013) in their research provided information that market credit interest rates show a negative and insignificant relationship with loan loss provision. Based on this information, the hypothesis H5 in this study is formulated as follows:

H5: Interest rates have a negative effect on Loan Loss Provision.

The Foreign Exchange Rate Moderates the Effect of Capital Adequacy Ratio on Loan Loss Provision

Yeh (2010) revealed that the capital adequacy ratio has a positive effect on loan loss provision. In Indonesia, banking and financial reporting are converted into Rupiah currency if the original currency is a foreign currency. The exchange rate can strengthen the effect of the capital adequacy ratio on the loan loss provision. The more the foreign exchange rate appreciates against the Rupiah, the higher the capital adequacy ratio causes the higher loan loss provision. For this reason, the research hypothesis H6 in this study can be postulated as follows:

H6: The positive effect of the capital adequacy ratio on loan loss provision will be more positive when the foreign exchange rate strengthens.

The Foreign Exchange Rate Moderates the Effect of Non-Performing Loans on Loan Loss Provision

Berti, Engelen, and Vašíček (2017) stated that there is a positive relationship between the foreign exchange rate of the euro or all foreign currencies with the ratio of Non-Performing Loans. Adeola and Ikpesu (2017) found that inflation and exchange rates have a

positive relationship with Non-Performing Loans. The research findings of Lim et al. (2013) and Sitanggang and Munthe (2019) showed positive results between non-performing loans and loan loss provision. The appreciation of foreign exchange rates can affect the value of Non-Performing Loans and the loan loss provision of a bank. For this reason, the research hypothesis H7 in this study can be postulated as follows:

H7: The positive effect of Non-Performing Loans on loan loss provision will be more positive when the foreign exchange rate strengthens.

The Foreign Exchange Rate Moderates the Effect of Interest Rates on Loan Loss Provision

Lim et al. (2013) suggested that market credit interest rates show a negative and insignificant relationship with loan loss provision. In financial reporting in Indonesia, banks report in Rupiah. If the loan loss is in the form of foreign currency and the foreign exchange rate appreciates, the value of the loan loss provision will increase. On several occasions, there have been policies taken by banks to increase interest rates due to the weakening of the Rupiah against foreign currencies, so that the increasing exchange rate will increase interest rates. For this reason, the research hypothesis H8 in this study can be postulated as follows:

H8: The negative effects of interest rates on loan loss provision will be more negative when foreign exchange rates strengthen.

Non-Performing Loans Mediate the Effect of Capital Adequacy Ratio on Loan Loss Provision

The capital adequacy ratio is a capital ratio that shows the ability of a bank to provide funds for business development as well as to accommodate the risk of loss caused by bank operations so that capital adequacy ratio can show the extent to which a bank's capital capacity is to bear the risk of credit failure. The effect of the capital adequacy ratio on Non-Performing Loans is also obtained from two previous studies by Wood and Skinner (2018)

and Vatansever and Hepşen (2013) which showed the value of the capital adequacy ratio has a positive influence on the value of Non-Performing Loans. This statement is reinforced by research conducted by Yeh (2010) which stated that the capital adequacy ratio has a positive effect on the loan loss provision. Based on their studies, the research hypothesis H9 in this study can be postulated as follows:

H9: The positive effect of the capital adequacy ratio on loan loss provision will be more positive when Non-Performing Loans increase.

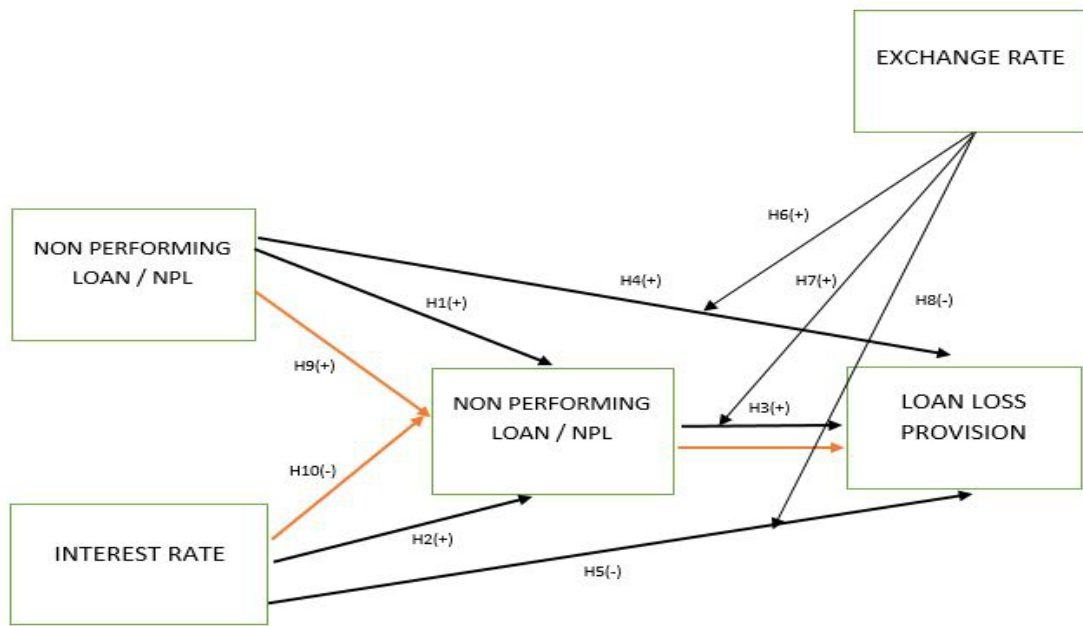
Non-Performing Loans Mediate the Effect of Interest Rates on Loan Loss Provision

The interest rate can be interpreted as the price that must be paid by the customer to the bank when the customer obtains a loan. The loan loss provision is the amount of funds that must be prepared by a bank to face losses in the event of bad credit. Lim et al. (2013) in their research provided information that market credit interest rates show a negative and insignificant relationship with loan loss provision. The effect of the Non-Performing Loans on loan loss provision is also obtained from two previous studies by Lim et al. (2013) and Sitanggang and Munthe (2019) which showed positive results. Based on their studies, the research hypothesis H10 in this study can be postulated as follows:

H10: The negative effect of interest rates on loan loss provision will be more negative when Non-Performing Loans increase.

Figure 1

Research Thinking Framework



Methods

In this study, the dependent variable was the loan loss provision, known as *Cadangan Kerugian Penurunan Nilai* in the Indonesian language and abbreviated into LLP. The independent variables were Capital Adequacy Ratio (CAR), and Interest Rate (INT). The mediating variable in this study was Non-Performing Loans (NPL), while the Foreign Exchange Rate (KURS) as a moderator variable was measured by the USD exchange rate against the Indonesian Rupiah.

The data collection method used in this research was the documentation study method of obtaining data in the form of quarterly reports that had been published by the banks from 2013 to 2018 on the Bank Indonesia website (www.bi.go.id) and the banks' websites. Literature studies through textbooks, scientific journals, articles, and magazines as well as other written sources related to the required information were also used as sources of data collection. The samples were taken from each of these banks, 24 data per bank, with a total of

72 data. The analysis was carried out using multiple linear regression analysis and path analysis.

Data Analysis Technique

To perform tests using multiple regression analysis, the following structural equation models are used:

$$\text{Equation (1): } NPL = \beta_1.CAR + \beta_2.INT + \epsilon_1$$

$$\text{Equation (2): } LLP = \alpha_1.CAR + \alpha_2.INT + \alpha_3.NPL + \alpha_{12}.CAR \times KURS + \alpha_{22}.INT \times KURS + \alpha_{32}.NPL \times KURS + \epsilon_2$$

Results and Discussion

The following Table 1 shows the results of the goodness of the fit model (F-test) of both equations.

Table 1

The F test of Structural Equation 1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.317 ^a	.101	.074	.00620	.266

a. Predictors: (Constant), INT, CAR

b. Dependent Variable: NPL

F-value = 3.856 with sig (F) = 0.026

Table 1 shows that the R Square 0.101 explains that the 10.1% variation in the level of the ratio of Non-Performing Loans (NPL) can be explained by the variables of the Capital Adequacy Ratio (CAR) and the Interest Rate (INT). The rest is explained by other factors outside of the regression model. Table 1 shows the ANOVA significance value of 0.026

which is smaller than 0.05 so that the regression model is feasible to be used to predict the NPL variable based on variables CAR and INT.

Table 2

The F test of Structural Equation 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.789 ^a	.623	.588	.29920	0.241

a. Predictors: (Constant), NPL_KURS, CAR, NPL, INT, INT_KURS, CAR_KURS

b. Dependent Variable: LLP

F-value = 17.915 with sig (F) = 0.000

Table 2 shows that the R Square 0.623 explains that the 62.3% variation in loan loss provision (LLP) can be explained by the variables of the Capital Adequacy Ratio (CAR), Interest Rate (INT), Non-Performing Loans (NPL), and the moderated variables by the foreign exchange rate (KURS). The rest is explained by other factors outside of the regression model, with sig (F) of 0.000 which is smaller than 0.05, so that the regression model can be said to be fit or feasible to be used to predict the LLP variable based on independent variables CAR, INT, NPL, and KURS as moderator variables.

Test the Significance of Each Regression Coefficient (T-Test)

The test results of each regression coefficient can be seen in Tables 3 and 4 as below:

Table 3

The T-Test of Coefficients: Structural Equation 1

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
	B	Std. Error	Beta	t	Tolerance	VIF

1	(Constant)	.007	.010		.659	.512		
	CAR	.091	.040	.323	2.304	.024	.665	1.503
	INT	4.851E-5	.001	.010	.069	.945	.665	1.503

a. Dependent Variable: NPL_t

Table 3 shows that CAR has a significant positive effect on NPL with a sig (t) value of 0.024 which is smaller than 0.05. Thus, the research hypothesis H1 is accepted. The CAR has a positive significant effect on NPL. The higher the capital adequacy ratio, the higher the non-performing loan. Banks that have a high capital adequacy ratio will be able to deal with an increasing level of NPL. So a bank usually predicts the value of the capital adequacy ratio well in order to be able to cope with the increasing value of NPL. While the interest rate (INT) with a sig (t) value of 0.945 is greater than 0.05, the interest rate does not have a significant positive effect on NPL. The research hypothesis H2 is rejected because there is not enough evidence that the interest rate has a positive effect on NPL. The increase in interest rates does not always make NPL rise because interest rates have hybrid implications, especially the term of loans.

Table 4

The T-Test of Coefficients: Structural Equation 2

Non-Performing Loans' Impacts on the Banking Industry

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	13.768	.537		25.621	.000		
CAR	16.067	2.215	.765	7.253	.000	.522	1.916
INT	-.020	.038	-.054	-.527	.600	.543	1.841
NPL	1.294	6.903	.017	.187	.852	.697	1.436
CAR_KURS	.151	.287	.279	.525	.601	.021	48.720
INT_KURS	.007	.007	.453	1.024	.310	.030	33.767
NPL_KURS	-3.739	1.878	-.851	-1.991	.049	.032	31.542

a. Dependent Variable: LLP

Table 4 shows empirical evidence at the 5% level of significance, that the significant factors that influence the Loan Loss Provision (LLP) are Capital Adequate Ratio (CAR), which has a positive effect on LLP, and NPL with USD Exchange Rate (NPL-KURS), which has a negative effect. These results imply that the research hypotheses H4 and H7 are accepted. These findings prove that the greater capital adequacy ratio leads the greater loan loss provision, and vice versa. If the Capital Adequacy Ratio (CAR) increases, it means a bank has a provision of funds for lending to the public which will make the value of the LLP increase. And the USD exchange rate negatively and significantly moderates the effect of Non-Performing Loans on loan loss provision. The positive effect of NPL on loan loss provision will decrease when the USD appreciates, while the variables of INT and NPL, and the interaction variables of CAR-KURS and INT-KURS, have no significant effect on Loan Loss Provision (LLP). These results imply the rejection of the research hypotheses H5 and H6. These findings show that there is not enough evidence to prove that the loan loss

provision is partially affected by the variables of INT and NPL. The findings showed that the interaction between the moderator variable (USD exchange rate toward IDR) and the variables of capital adequacy ratio and interest rate does not significantly affect the loan loss provision.

Path Analysis

Path analysis was used to determine the direct or indirect effect where the Non-Performing Loans (NPL) become an intervening variable that mediates the effect of capital adequacy ratio (CAR) and interest rate (INT) on the loan loss provision (LLP).

Table 5

Path Analysis of Intervening Variable Testing

Effect	CAR → NPL → LLP	INTEREST → NPL → LLP
Direct	0.765 ^{*)}	-0.054
Indirect	0.323 x 0.017 = 0.005491	0.01 x 0.017 = 0.00017
Total	0.770491	-0.05383

Note: ^{*)} significant at a 5% level of significance (tested by Sobel test).

Table 5 shows that the Non-Performing Loans (NPL) significantly mediates the positive effect of the capital adequacy ratio (CAR) on loan loss provision (LLP). Thus, the research hypothesis H9 is accepted. The positive effect of capital adequacy ratio (CAR) on loan loss provision (LLP) will be more positive when the Non-Performing Loans (NPL) increases, and vice versa. Table 5 also shows that the non-performing loan (NPL) does not significantly mediate the negative effect of interest rates (INT) on loan loss provision (LLP). Therefore, the research hypothesis H10, which stated the negative effect of interest rates on loan loss provision will be more negative when the non-performing loan decreases, is rejected.

Conclusion

The results of this study provide several conclusions and suggestions which at the same time answer the research questions of this study. The capital adequacy ratio has a significant positive effect on Non-Performing Loans, while interest rates have no significant effect on Non-Performing Loans. Non-Performing Loans have no significant effect on the loan loss provision. The capital adequacy ratio has a very significant positive effect on the loan loss provision. However, the interest rate does not significantly affect the loan loss provision. The USD exchange rate does not significantly moderate the positive effect of the capital adequacy ratio on the loan loss provision. The USD exchange rate significantly moderates the negative effect of Non-Performing Loans on loan loss provision. The positive effect of Non-Performing Loans on loan loss provision will be more positive when the USD depreciates against IDR, and vice versa. However, the USD exchange rate does not significantly moderate the positive effect of the interest rate on the loan loss provision. Finally, Non-Performing Loans significantly mediate the positive effect of the capital adequacy ratio on the loan loss provision. The positive effect of the capital adequacy ratio on loan loss provision will be more positive when the Non-Performing Loans increases, and vice versa. However, the Non-Performing Loans do not significantly mediate the negative effect of interest rates on the loan loss provision.

The results of the path analysis in this study reveal that the non-performing loan positively mediates the effect of the capital adequacy ratio on loan loss provision. So it can be suggested that increasing the loan loss provision through increased capital adequacy ratio should be done when the Non-Performing Loans increase. Likewise, the findings reveal that the positive effect of Non-Performing Loans on the loan loss provision will be negative when the USD appreciates against IDR. So, it can be recommended to decrease loan loss provision.

Decreasing Non-Performing Loans should be done when the foreign exchange rate (USD) against Indonesia Rupiah (IDR) is strengthening.

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Cryptocurrency and Its State of Research

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Abstract

This article maps the existing academics and working papers about cryptocurrency or digital currency that uses blockchain. Cryptocurrency is one of the applications of blockchain that can accelerate economic digitalization within countries, which in the end could improve economic efficiency, effectiveness, and access for citizens. By the type of issuers, cryptocurrencies can be placed into three categories: central bank-issued digital currency, private institution digital currency, and peer-to-peer crypto-assets. The advent of cryptocurrencies requires strong regulatory frameworks to protect the users, ethics guidelines to direct the development, risk benefits study to identify pitfalls, users' psychology, law enforcement guidelines to ensure a safe environment, and economic initiatives to provide society with maximized benefits. This paper shows research findings, methods, and future research directions in cryptocurrency.

Keywords: cryptocurrency, digital currency, digitalization, blockchain

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Cryptocurrency and Its State of Research

Financial technology (fintech) is an industry that grows rapidly and has a high compound annual growth rate (CAGR) (CB Insights, 2019). Fintech is the future of the financial industry, by which consumers and businesses can access financial services and products digitally, innovative market participants can deploy new innovative technologies, and existing business models can upgrade their capacities and capabilities to fulfill consumers' needs. Fintech helps consumers and businesses handle the impact of the Covid-19 pandemic.

To integrate digital technology innovations into people's lives, users need to feel long-lasting valuable effects. To sustain this integration, firms must gain sustainable competitive advantages. Fintech refers to the financial service companies that dominantly use information technologies in their operation to deliver their products to serve consumers. Fintech companies offer financial services and products that are entirely or mostly in the information technologies domain, and those services or products are difficult or impossible to perform in conventional business because of the limitations in infrastructure.

Authorities see fintech as a means to increase financial inclusion for consumers and encourage companies to innovate processes, services, and products. Fintech helps reduce costs, increase the reachability of customers, and manage risks more efficiently. Fintech companies provide quicker, better quality, more convenient, and cheaper financial services with a seamless process 24 hours a day, seven days a week, or nonstop, compared to conventional financial companies.

Fintech uses advanced technologies such as artificial intelligence, machine learning, and data science to develop solutions for financial needs (Hua et al., 2019). One example of a development in fintech is cryptocurrency. This paper examines research findings, methods, and future research directions to identify to map the existing landscape of cryptocurrency. As

cryptocurrency technology is still developing, a comprehensive cryptocurrency literature review will help researchers to advance research in this particular field.

Cryptocurrency is not a new term that exclusively belongs to this era; in 1983, David Chaum wrote about the use of cryptography applications for future e-cash. Cryptocurrency, also known as virtual currency, is an online payment system that may function as real currency but is not administered or ratified by a central government (Lovell, 2019).

The European Central Bank (ECB) sees cryptocurrency as one type of crypto asset, which is defined as a new type of “asset recorded in digital form and enabled by the use of cryptography that does not represent a financial claim on, or a liability of, any identifiable entity” (Agur et al., 2022). Cryptocurrency is electronic-based money or virtual currency that exists only on the internet, that may or may not have intrinsic value backed by an institution, and that uses cryptography to secure the generation, transaction, and storage of its value (Wu et al., 2022).

Since the beginning of the 21st century, people all over the world have seen a decline in the use of cash, especially during the Covid-19 pandemic. The ECB recorded that in 2019, only 48% of the total transactions in Europe used cash (European Central Bank, 2020). Consumers use commercial bank money, private-issued electronic payment forms of money, and private-issued cryptocurrency (Cœuré & Loh, 2018).

Literature Review

Cryptocurrency, as part of fintech, uses blockchain technology combined with cryptography or encryption as the core to secure the financial activities related to its currency function. With blockchain, the participants of a financial system can easily find out the list of approved transactions by entering the private key into the system. Once verified, the transaction will become part of the blockchain (Afzal & Asif, 2019).

Cryptocurrencies utilize blockchain technology to enable the remote peer-to-peer transfer of electronic value where there is no trust between participants, also known as zero trust architecture. In a conventional system, the electronic representations of money are exchanged via centralized infrastructures, where one of the more trusted intermediaries verifies and settles the transactions.

Blockchain is often referred to as a distributed ledger technology that enables participants within the systems to transact without the need for a centralized trusted authority that stores peer-to-peer transactions record in blocks that are subsequently appended as new transactions happen (Mending et al., 2018; Woodside & Amiri, 2018). In other words, blockchain is a decentralized cryptography platform that records all information about the transactions ever executed within the system, using consensus protocols in a digital ledger stored in every participant's location that ensures a verifiable, unchangeable, and secure way to fulfill immutability, transparency and anonymity principles.

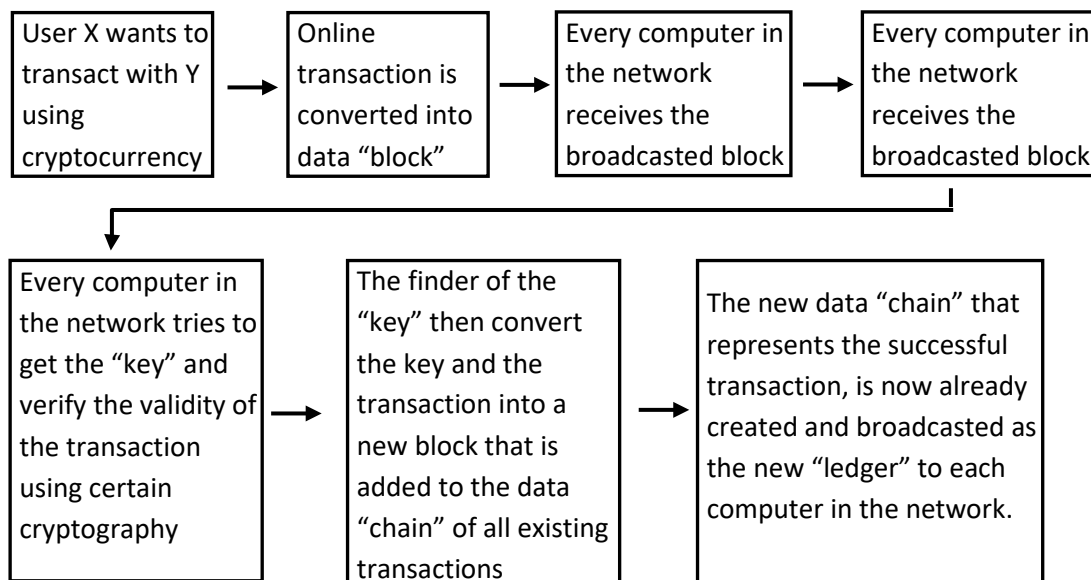
Distributed ledger technology (DLT) refers to the algorithms, protocols, and infrastructures that allow computers or machines in various locations to request a transaction, validate the transaction, and update transaction records in a synchronized way across a network. Cryptocurrencies have a distributed database in a decentralized way, where every transaction is validated using a consensus-based checking procedure and cryptographic parameters. Transactions are broadcast to the entire set of participants who will validate them in batches of data known as "blocks," without any centralized authority, or popularly known as "peer-to-peer." The ledger of these activities is recorded in separate but connected digital blocks; thus blockchain is also known as "blockchain technology."

Figure 1 below shows how blockchain works in cryptocurrency, from a transaction request to the final stage of a transaction. The advent of cryptocurrencies generates many opportunities such as fast, efficient, anonymous, and unmediated transactions (Arias-Oliva et

al., 2021). However, there are still concerns regarding blockchain and its applications in society. As understanding the potential consequences of blockchain technology develops, moral and ethical challenges need to be addressed (Tang et al., 2020).

Figure 1

Blockchain Process from Transaction Request to Final Settlement (World Economic Forum)



Adapted from “Cryptocurrencies, Blockchain and Regulation: A Review,” by Afzal and Asif (2019).

There are numerous cryptocurrencies currently in the market, but generally, they can be categorized into three groups of issuers: Central Bank Digital Currency (CBDC), commercial banks, and crypto-assets. In the CDDBC case, the central banks supply cryptocurrencies in the form of electronic reserves, which are available only to the banking sector and are then distributed through financial institutions.

As for the cryptocurrencies issued by commercial banks, they are created by credit extensions that are backed by a real capital investment of fiat money. As for the crypto-assets, the cryptocurrencies issued have no centralized technical processing, without the precondition of trust to any institution, and without preset liability of any party to vouch for the intrinsic

value. Among the most popular crypto-assets are Bitcoin, Ethereum, Ripple, Litecoin, Monero, Ethereum Classic, NEM, Dash, IOTA, Waves, Dogecoin, and Augur (Milutinović, 2018).

Many countries have their cryptocurrencies issued by private institutions in various countries, such as Gopay by Gojek, QQ Diamond by QQ, Libra by Facebook, and E-money by Indonesian government banks. Currently, there are numerous pilot projects and launched CBDC, including e-Yuan in China, Digital Euro in Europe, e-Krona in Sweden, and DCash in Eastern Caribbean nations (Bordo & Levin, 2017; Mitschke, 2021). Cryptocurrencies have attracted the attention of information technology professionals, economists, investors, banks, governments, and law enforcement agencies (Molling et al., 2020).

The potential impacts of cryptocurrencies have been recognized by government institutions such as the European Central Bank, the US Federal Reserve, the UK Treasury, the People's Bank of China, the Bank of Indonesia, and other related governmental institutions. Corporate reports, government agencies' working papers, and academic research papers about cryptocurrencies are answering the challenge to understand cryptocurrencies. Countries such as China, Europe, and the UK, along with international financial organizations, have produced policy recommendations, guidance, and principles to apply cryptocurrencies in the current financial system. This paper maps the landscape of cryptocurrency academic research.

Research Method

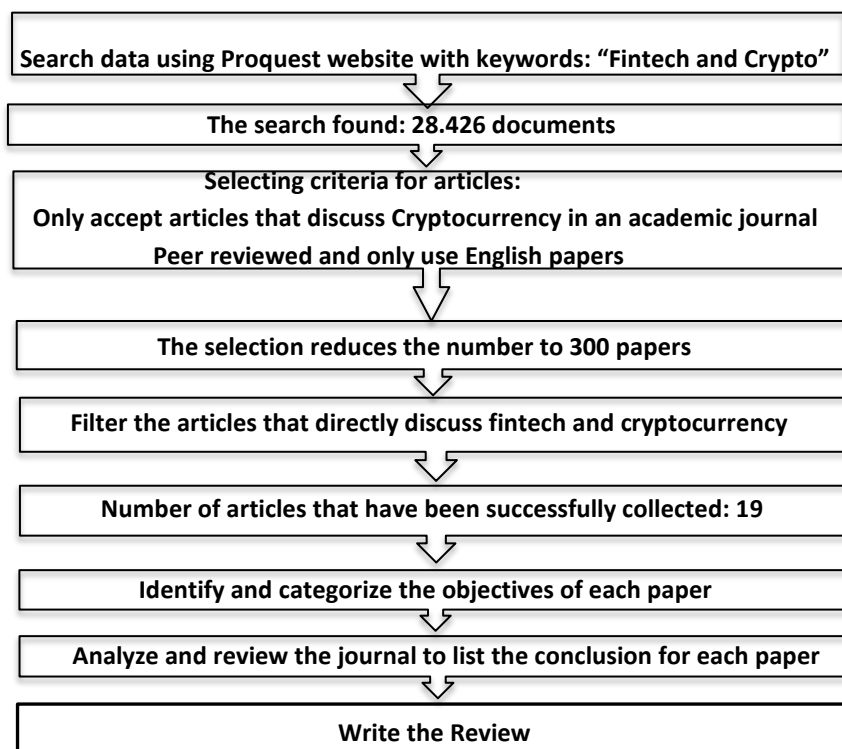
We conducted a review of the existing academic and working papers concerning cryptocurrency or digital currency that uses blockchain. A review is a method to map and identify key points within existing literature considered suitable for the complex research area.

To achieve a systematic review, relevant documents about cryptocurrency were retrieved using ProQuest search. The search keywords were “Fintech” and “Crypto.” We then

selected documents that were available with full text in scholarly journals that had gone through peer-review, with English as the language of the text. As the result, 19 papers remained.

Figure 2

Framework to Select the Articles



In Google Scholar, three relevant working papers from the European Commission and National Bureau of Economic Research about Digital Currency and Cryptocurrency were also selected. Thus, in total, there were 22 papers used in the review. The purposes and methods of the collected documents were then put in a table for future review. The last step was to further elaborate on the selected papers and provide conclusions for future research suggestions.

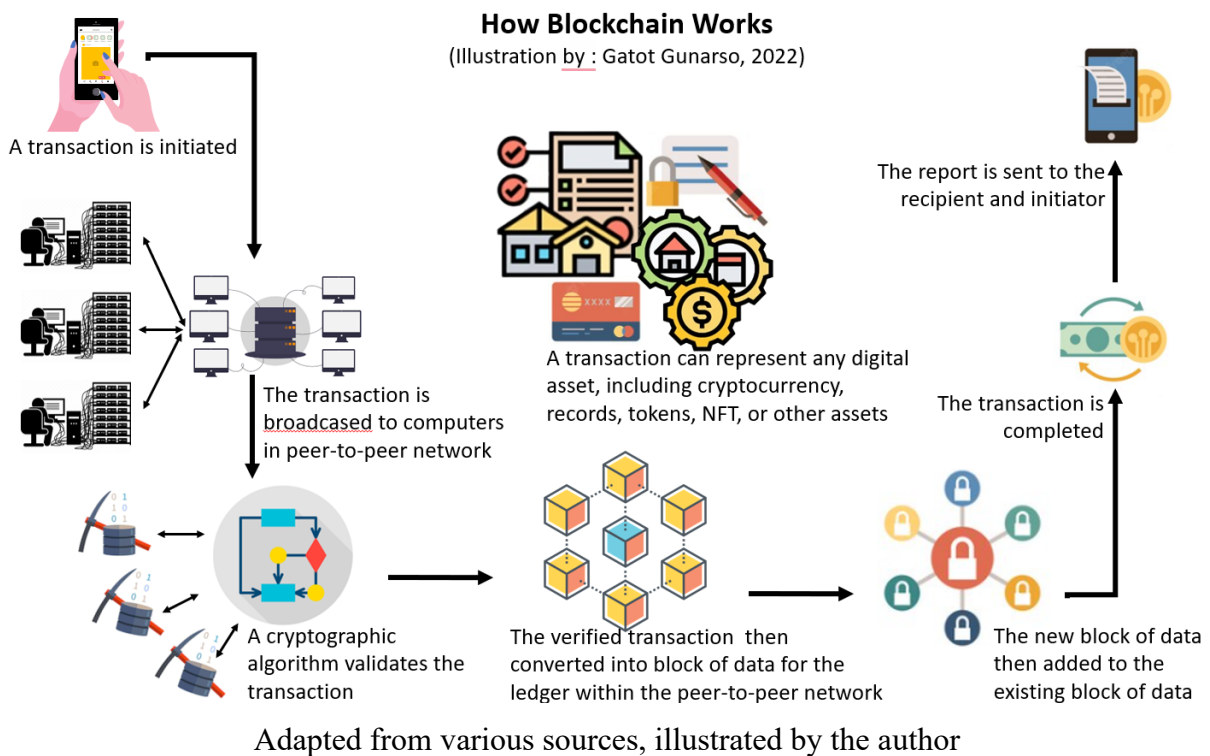
Results and Discussion

Blockchain technology has become a popular new technology that brought forth digital products such as cryptocurrencies, smart contracts, smart identification, and tracking, among others. Blockchain technology itself is a distribution register consisting of blocks of

interconnected transactions. Transaction blocks are called registry nodes. In general, they represent a decentralized database designed to store and confirm the reliability of information (Tsindeliani & Egorova, 2020).

Figure 3

How Blockchain Works



When a participant in the system requests a transaction, the request is broadcast to all peers (computer nodes) in the network, and eventually reaches certain computer nodes that function as miners. A miner will initiate the process to append the transaction into the global ledger by including the request in the transactions pool, which the miner then adds the hashes to the metadata and a nonce to try to produce a hash below a target value (defined by the complexity of the network).

Once a miner is successful in producing the needed hash, the miner broadcasts the transactions pool and its associated hash as a new block replacing all the previous blocks in all active nodes. Included within the metadata in the new block is a reference to the

previously mined block, allowing the acceptance of the miner's new block into the blockchain.

Miners are incentivized by two rewards: the fees in individual transactions, and a system-specific mining reward, for example, 0.01 Bitcoin. These rewards are then collected in a special coin generation transaction within the new block's transaction pool.

Blocks serve to generate the money supply through the mining rewards included in each new block and to provide partial transaction orders that come before the new block is generated. This algorithm allows all participants in the network to impose a global or partial transactions order. The algorithm will prevent double-spending by maintaining a list of unspent blocks and validating a transaction only if its input address appears in this list. The storage of the maintained list is called a crypto-wallet.

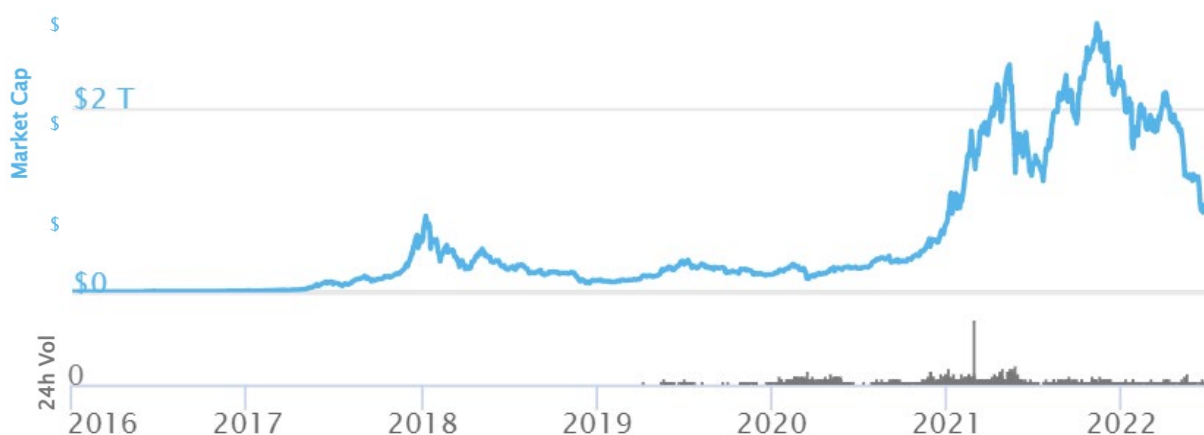
The market capitalization of cryptocurrencies was non-existent before February 2010, virtually very small before 2013, and was relatively stable at less than \$20 billion until the end of 2016 when it became volatile and has been ever since (Fan et al., 2022). At the end of 2017, it rose to over \$200 billion, then at the beginning of 2018, the market capitalization rose to over \$800 billion. In December 2018, the capitalization fell to below \$130 billion and was volatile again after the Covid-19 pandemic spread throughout the world in March 2020, when the capitalization peaked again at over \$2 trillion in May 2021. The market cap then fell to \$1.2 trillion in June 2021 after the second wave of COVID-19, peaked all-time-high of \$2.9 trillion in November 2021 after the US and European countries relaxed their pandemic restrictions, fell deep to \$1.2 trillion due to the massive selling in March 2022 after the Russian invasion over Ukraine, then fell deeper to \$868 billion in June 2022 due to the fear of worldwide recession.

The following graph shows the volatility of the market capitalization of cryptocurrencies, which implies the volatility of the value of cryptocurrencies in the face of

fiat money. Volatility also indicates the popularity, trading volume, and susceptibility of cryptocurrencies to speculative bubbles, high energy prices, and geopolitical situations among other factors. Although not directly related, the graph also implies the number of manipulations, scams, and fraud risks related to the popularity of cryptocurrency.

Figure 4

Total Cryptocurrency Market Capitalization from 2016 to 2022



Adapted from www.coinmarketcap.com

The graph alone represents the growing expectations and hopes of the consumers to use an electronic representation of money, whether for the real purpose of payment or speculative purposes. The growth shows the importance of mapping the knowledge landscape about cryptocurrencies related to the economic condition of countries, including trade, commerce, law and regulation, security, and safety matters.

There are several benefits of cryptocurrency. First, the government cannot appropriate, manipulate, or change the value of the cryptocurrency. Second, it is considered a secure transaction against fraud and identity theft, an immediate and final settlement, and information-accessible for all participants. Third, it has lower transaction, maintenance, storage, and circulation fees. Fourth, cryptocurrency is more convenient for the participants to

transact without the need for an intermediary or centralized regulator. Fifth, it offers a higher degree of freedom to transact due to the anonymous nature of cryptocurrencies.

However, all these perks are not entirely certain. For example, the government can still confiscate the hardware that holds the digital wallet containing the cryptocurrencies. The hackers still can steal the digital wallet stored in the cloud server. The device to mine cryptocurrencies requires very high-performance capability. Additionally, the participants still need a cryptocurrency exchange platform to trade the cryptocurrency for fiat money, and there are limited types of goods and services available for trade with the cryptocurrencies.

The disadvantages of cryptocurrencies are price volatility (Todorof, 2019), lack of market transparency (Commission, 2018; Cumming et al., 2019), low market integrity (Lee, 2020), and lack of investor and consumer protection (Kharisma, 2021), lack of adequate law and supervision process (Tsindeliani & Egorova, 2020), high demand of high-performance computing hardware (Ghiro et al., 2021), high consumption of electrical power (Schinckus et al., 2020), susceptibility to energy prices (Gurrib, 2019), operational weaknesses, popularity as a tool for illicit payment for illegal transactions (Afzal & Asif, 2019), the technical vulnerabilities of services and trading venues (European Central Bank, 2020), the difficulty to intervene the exchange rate with conventional monetary policy (Mitschke, 2021), and the possibility of using cryptocurrencies for criminal purposes (Şcheau et al., 2020), including money laundering and tax evasion (Barnes, 2018; Todorof, 2019).

Table 1

List of Papers, Purpose, and Methods

Author	Purpose of Articles	Method
Scheau et al., 2020	Examines the worldwide operation of cryptocurrencies and their connections with cybercrime.	Literature review and quantitative

Author	Purpose of Articles	Method
Lovell (2019)	Explores different issues surrounding Bitcoin and how the U.S. government, specifically the Internal Revenue Service (IRS), should regulate cryptocurrencies to solve the issues inherent within Bitcoin.	Case study
Chu (2018)	Explores experiences of broker-dealers, and the similarities between the problems confronting cryptocurrency platforms today and those that broker-dealers faced in the late 1960s. Widespread broker-dealer failures during the late 1960s revealed problems with mishandled client assets, insufficient capital, and inadequate protection of customer assets in bankruptcy.	Literature review
Barnes (2018)	Examines the trading and popularity of cryptocurrencies as investments and the susceptibility of their pricing to speculative bubbles, manipulation, scams, and fraud.	Quantitative
Afzal & Asif (2019)	Addresses various risks associated with an unregulated cryptocurrency market and, discusses possible avenues of regulation as well as applications of the cryptocurrency technology for Pakistan.	Framework building and quantitative
Milutinović (2018)	Addresses the theme of cryptocurrency and its role in economic growth. Types of cryptocurrencies are shown as well as their expansion in countries in transition. The market of cryptocurrency in Serbia and Switzerland is discussed.	Framework building and quantitative
Molling et al. (2020)	Identifies main topics, main discussions, and controversies on each topic presented in the literature on cryptocurrencies.	Literature review and framework building
Tsindeliani & Egorova (2020)	Shows the legal status quo of cryptocurrencies in the Russian Federation. Describes references to the existing and proposed legislation as well as to the statements of	Qualitative and descriptive

Author	Purpose of Articles	Method
	several international, supranational, and national regulatory bodies.	
Cortez & Mongrut (2021)	Determines the best model for predicting the short-term log rates of the bid-ask spreads in the three biggest cryptocurrencies—Bitcoin, Ripple, and Ethereum—and in the 16 major fiat currencies listed by Bloomberg.	Literature review and quantitative
Arias-Oliva et al. (2021)	Shows empirically that fsQCA provides a complementary and enriching perspective to interpret data about the use of cryptocurrencies.	Literature review and quantitative
Kliber & Włosik (2019)	Investigates interdependencies between leading cryptocurrency exchanges (American, European, and Japanese).	Literature review and quantitative
Mazambani & Mutambara (2020)	Applies the theory of planned behavior (TPB) to predict behavioral intention to adopt cryptocurrency.	Literature review and quantitative
Cumming et al. (2019)	Explains the regulatory and security issues around blockchain and initial coin offerings (ICOs) in an increasingly decentralized economy. Examines ICO structures and how this crowdfunding mechanism has the promise for economic innovation. Explains how fraud may be carried out within these innovative asset classes, and the evolving regulatory struggles.	Framework building
Duma & Gligor (2018)	Identifies general insights of payment behavior of the students about cryptocurrencies. Assesses students' overall knowledge about cryptocurrencies.	Qualitative
Othman et al. (2020)	Investigates the long- and short-run effects of cryptocurrencies' market capitalization development on the banks' deposit variability in the Gulf Cooperation Council (GCC) region.	Literature review and quantitative
Stepanov et al. (2019)	Identifies provisions needed for implementing law enforcement internationally for digitalization-related matters, including prosecution process, decision	Literature review

Author	Purpose of Articles	Method
	making, coordination among law enforcement officers, and assessment of performance. Comparison of legal methods, dialectical methods, and analytic methods within countries concerning digitalization matters.	
Tang et al. (2020)	Reviews the ethics of blockchain, the main socio-technical challenges in technology and applications, and ethical issues of blockchain. Builds a conceptual framework for blockchain ethics study.	Literature review
Hua et al. (2019)	Reviews studies in the fintech areas, such as artificial intelligence, blockchain, and crowdfunding. Summarizes the contributions made by all six papers in the special issue where this paper was published.	Literature review
European Central Bank (2020)	Examines the issuance of the Digital Euro as a central bank digital currency (CBDC) from the perspective of the Eurosystem.	Literature review
Mitschke (2021)	Examines the effectiveness of Central Bank Digital Currency and monetary policies.	Quantitative
European Central Bank (2021)	Analyzes the digital adoption across the Euro area and EU countries, the implications of digitalization for measurement, productivity, labor markets and inflation, and the coronavirus (COVID-19) pandemic and its implications.	Literature review
Vasiliev et al. (2020)	Analyzes opportunities and prospects for the implementation of artificial intelligence in the legal system. Identifies possible areas of large-scale digital legal activities.	Literature review and framework building

Cryptocurrency uses the digitization process of money that has grown in popularity with fintech adoption that making money movement cheaper, faster, and more secure. Cryptocurrency works on a peer-to-peer basis to facilitate the creation, transfer, or storage of funds with or without a centralized ledger. The peer-to-peer basis can be distributed

physically or logically in separated areas, as well as in one area. Cryptocurrency can be regulated or non-regulated by a government, depending on the initial design.

According to their liability’s bearer, cryptocurrencies can be categorized into three types: central bank, private entities, and no-bearer. For a cryptocurrency or digital currency issued by a central bank within a country or region, the same central bank is liable at all times to ensure the value of the cryptocurrency for buying goods and services does not fluctuate over time (European Central Bank, 2020). A central bank is accountable to the citizens where it is located. In theory, a central bank cannot default or fail to fulfill its obligation to the citizens.

Table 2

Characteristics of CBDC and Other Money-like Assets

	Current types of money			Private sector solutions		CBDCs		
	Central bank money		Commercial bank money			General	Digital euro	
	Reserves	Bank-notes	Deposits	Bitcoins	Libra/Diem			Bearer digital euro
Liability of the central bank	✓	✓	X	X	X	✓	✓	✓
Electronic form	✓	X	✓	✓	✓	✓	✓	✓
Universal access	X	✓	✓	✓	✓	(*)	✓	✓
Interest bearing	(✓) (excess reserves)	X	(✓)	X	X	(*)	X fixed (probably 0)	✓ variable (linked to policy rate, evtl. tiered)
Convertibility (trades at par with other CB liabilities)	✓	✓	✓	X	?	(*)	✓	✓
Limited supply	X	X	X	✓	X	(*)	(✓)	X
DLT	X	X	X	✓	✓	(*)	(✓)	X
Front-end infrastructure (token- or account-based)	CB-A	T	B-A	T	A	(*)	T	CB-/B-A

Own representation based on Bech and Garratt (2017), BIS (2018), Meaning et al. (2018), ECB (2020)

✓ = existing or likely feature, (✓) = possible feature, X = not typical or possible feature, (*) = depends on central bank's design choice
 CB= central bank; B= bank; C= centralised, D= decentralised; T= token-based, A= account-based

Adapted from “Central Bank Digital Currencies and Monetary Policy Effectiveness in the Euro Area,” by A. Mitschke (2021).

For a cryptocurrency issued by a commercial bank or private institution, the commercial bank or private institution holds the liabilities and must comply with the regulations supervised by public authorities. In theory, the private entity could default and be unable to fulfill its liabilities or the claims of its customers. Although the customers are protected by a legally binding regulatory framework within a country, the private issuer is only accountable within their promises and business limits. The regulator or public authority, through law and regulations, could require the private entity to be protected by deposit insurance schemes. The regulator could also provide lending for a troubled private entity in exceptional situations.

For a cryptocurrency issued by an unknown entity or in the popular term “crypto-assets,” no entity is liable to ensure anything of any kind. For this type of cryptocurrency, there is no reliable framework to sustain its value and protect its direct holders. These assets are unregulated, highly volatile in price due to lack of intrinsic value, and potentially could result in the loss of the entire amount of assets due to inconvertibility to fiat money.

One of the problems that emerge due to the cryptocurrency application is cybercrime, which includes the problem of manipulation and fraud that harms the owners of cryptocurrencies (Barnes, 2018; Cumming et al., 2019; Şcheau et al., 2020; Stepanov et al., 2019; Vasiliev et al., 2020).

A cryptocurrency exchange platform conducted a survey among 1108 traders between April 23 and April 30, 2018, and identified the three biggest problems in the cryptocurrency market: lack of security (40%), high trading fees (37%), and lack of liquidity (36%), where more specifically the biggest issue is the sophisticated hackers who compromised the exchange platform (Cortez et al., 2021). Types of crime related to cryptocurrency include crypto fraud, uncertain regulations, cyber security fraud, fictitious assets, fake investment

funds/advisors, unregulated manipulated crypto exchanges, exchange hacks, social media identity hacking, ransomware, crypto-jacking, and taxation fraud (Cumming et al., 2019).

Undoubtedly, this problem came about due to a lack of regulation, accountability, and a desire to create security with the brokerage by the founders, owners, and developers (Barnes, 2018). There are very few companies that comprehensively assess the risk of corruption or compromise of data privacy (Şcheau et al., 2020), so there are still many users who are afraid to invest in this currency because there is no guarantee of asset safety.

In response to the above problems, the US Congress and the SEC enacted the same application as broker-dealers who failed in the market and operational turmoil during the late 1960s. The need to issue regulations for broker-dealers is explained as follows (Chu, 2018):

- Historical Background – Understanding the regulations and potential applications of the currency platform will help bring understanding to its historical background. Congress enacted SIPA in 1970 in response to a series of broker-dealer failures that occurred.
- Customer Protection Rule - Customer protection rules are intended to separate the broker-dealer's activities and assets from those of its customers, ensuring that there are sufficient assets to satisfy the customer's claims in the event of a failure.
- Net Capital Rule - The net capital rule ensures that broker-dealers maintain sufficient liquidity to meet their customers' claims. However, the purpose of the net capital rule is not to avoid broker-dealer failure.
- Broker-Dealer Bankruptcy - Securities Investor Protection Act of 1970 (SIPA) provides further protection for customers. Looking for an alternative to the bankruptcy code, Congress established the Securities Investor Protection Corporation (SIPC) to oversee bankruptcy proceedings for broker-dealers.

Currency digitalization requires the solution of optimizing the decision-making process based on data collection, coordinating of actions of a large number of law enforcement officers, and permitting criminal cases to be conducted in an electronic form (Stepanov et al., 2019). The future of legal regulation is related to the implementation of criminal jurisdictional activities.

Future study is needed to assess the large-scale digital revolution that affects all spheres of society, including the area of legal activity, such as the initiative to use robot lawyers in legal corporations, automation of legal processes, use of smart contracts, application of blockchain technologies, and the proliferation of cryptocurrencies, including law enforcement about cybercrime (Vasiliev et al., 2020).

Cryptocurrencies are partly considered a threat to the banking sector, especially commercial banks, the central banking system, and the global financial system. With their continued use, appreciation of value, and speculative bubbles, cryptocurrencies threaten the economic stability of the foreign exchange market (Barnes, 2018; Othman et al., 2020). Digital payments dominate the market related of the activities of buyers who make online payments, and their money stored in an e-wallet is maintained. The literature (Duma & Gligor, 2018) includes research on some Romanian citizens, especially those who focused on Generation Z, as well as Gen-Tech or iGen who grew up with internet technologies.

The future of cryptocurrencies seems secure given the global push toward the Internet of Things. Institutional innovation and adoption of cryptocurrencies are in overdrive as they predict an increase in the use of digital currencies. There are shining accounts that can be changed by the widespread use of digital currencies and the democratization of the economy, especially in developing countries (Mazambani & Mutambara, 2020).

Bitcoin, Ethereum, and other non-CBDCs are now mostly considered digital assets that are used only for speculative investing. Meanwhile, DCash, e-Yuan, Digital Euro, and

other CBDCs from central banks of established countries are in the course to complement legal currency used for real-life transactions in their respective countries. Gopay, Wechat pay, Alipay, Samsung pay, Apple pay, Libra, and other various digital currencies are widely used in society's daily lives in various countries.

Bitcoin, as one of the non-CBDCs, is one of the most demanded cryptocurrency products in the market. Research from (Kliber & Włosik, 2019) says that the price interdependence between markets that allows Bitcoin trading in the same traditional currency (Euro and US dollar), is slightly higher than the spillover between Bitcoin market quotes in different fiat currencies. The problem of price determination and stability becomes one of the problems facing non-CBDCs. The problem will bring difficulties for the market in using cryptocurrencies as a stable and reliable currency.

Conclusion

This article shows that cryptocurrency is a very important innovation to the digital world of financial transactions, enabling its entire network to control multiple spending without the need for a central authority to permanently monitor and validate financial data. Cryptocurrencies will develop, along with their benefits and disadvantages, driven by technology and their need among consumers and financial institutions.

It should be noted that modern technology development will always precede regulations and all regulations have loopholes for criminal acts to enter. Therefore, the government must as soon as possible provide legal frameworks and standards for digital-based security to protect digital assets use, including the use of cryptocurrency. The modern stage of digitalization of justice requires the proactive introduction of modern technical means to achieve the objectives of market integrity, investor protection, and market sustainability with high effectiveness and efficiency (Stepanov et al., 2019).

Regulations that will be or are being made must facilitate safe and open financial markets and be adaptive enough to accommodate future developments in cryptocurrency. By adopting the principles of technology-neutral, a strategic framework for ethical cryptocurrency adoption, and clear law-making objectives, the government can design a legal framework that can minimize the adverse effects of using cryptocurrency as the complement for fiat money.

Future research direction should be aimed at identifying how to accelerate the development and adoption of cryptocurrencies within society. Research could also be aimed at identifying problems concerning cryptocurrency and its effect on productivity, the labor market, inflation, and monetary policy. There are also concerns about cryptocurrencies created by private entities would jeopardize the sovereignty of nations, thus deserving further investigation.

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Artificial Intelligence in a Christian Perspective of Humanity and Personhood

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Abstract

This article examines the notion of humanity and personhood in Artificial Intelligence (AI) from the Christian perspective. In general view, humanity is the human race collectively, while personhood is the state or fact of being a person, for the Christian, personhood is an exhibition of the unity of the spiritual and corporeal in human existence that represents an essential characteristic of a human being. The concept is rooted in the Book of Genesis chapters one and two where God created man in His Image (*Imago Dei*) and breathed into his nostrils the breath of life. AI on the other hand is a machine, but not a mere machine, since it has a purpose like a human being and also can evolve autonomously and unimaginably when it plugs into a network. Realizing this fact leaves a question of whether AI could hypothetically have personhood in the future, or if it already has since the beginning of its creation, even if it is only a minimal version of personhood. This exploration shows criteria of minimal personhood qualities equal to humanity according to the Christian perspective, through the literature study of the church fathers' writings about the body, soul, free will, and the possibility of the personhood of AI. From the Christian perspective, the current available AIs do not meet the minimal criteria of personhood. If hypothetically there will be an AI that can meet a few of the criteria, the Christian perspective sees that AI cannot supersede the image of God in which human beings are created.

Keywords: artificial intelligence, Christianity, human being, imago dei, personhood

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Artificial Intelligence in a Christian Perspective of Humanity and Personhood

Artificial Intelligence (AI) is a computer system that can think, reason, act, expand, and evolve like a human (Hildebrandt, 2008; Schreurs et al., 2008). For the last two decades, AI systems have been deployed in many applications, such as in computer games, medical analysis, economic modeling, weather forecasting, biometric recognition, speech and text translation, disaster prevention, and autonomous vehicles. Many experts believe that artificial intelligence will improve people's lives in the future, but many are also concerned about the effect of AI on the meaning of humans, productivity, and the exercise of free will.

The AI system that is used to do something to get the same results as human intelligence in a particular domain is called "weak AI." A weak AI can play chess but cannot be used to score credit applications without a major adjustment to the algorithm. On the other hand, the hypothetical AI system that is used to achieve results in a broad domain and has self-awareness is called "strong AI." A strong AI is intelligent enough to do multiple tasks in multiple domains similar to humans and has self-awareness. The industrial applications of weak AI raise ethical issues about entrusting tasks and decisions to machines, while the applications of strong AI raise issues about the nature of humanity (Bjork, 2008).

In the 1980s, "Star Trek: The Next Generation" introduced the character "Data," an android that has advanced AI in the brain. This character, Data, can store, analyze, and learn about information from its surroundings, then work based on the instructions given by his superiors. Although emotion, intuition, and other social competencies are not part of his system, Data strives to become more like a human through experiences. At the end of its lifetime, sixty years after its creation, Data is portrayed as having an understanding of human emotion, having wishes of his own, and even a romantic relationship with a human officer. This series shows the imagination of how the progress of AI evolution is very significant in a very short time.

The AI adoption, progress, and future implications are beyond people's imagination and will make big changes in every aspect including religion. One of many issues highlighted in religion is whether AI has a personality or not. For some experts, AI has several attributes similar to the human way of thinking such as rationality, decision-making ability, the ability to evaluate results, and the ability to make corrections on future actions. However, there are debates about whether AI can fulfill philosophical, ontological, epistemological, theological, ethical, metaphysical, and/or moral positions similar or equal to humans (Bjork, 2008; Erisman & Parker, 2019; Schuurman, 2018). What equalities may be considered to define the personhood of something? Can AI be considered to have the qualities of personhood?

Literature Review

Personhood in the Philosophical View

John Locke defines a person as a thinking intelligent being that has reason and reflection and can consider itself as itself, the same thinking thing, in different times and spaces (Locke, 1948). A person in this definition is a mental subject. But what is significant for personhood is not just consciousness or reason, but self-consciousness: the capacity not only to have thoughts, feelings, and desires, but to be aware of oneself as the being who is having these thoughts, feelings, and desires.

It is important to see Baker's distinction between the strong and weak kinds of first-person phenomena to be clearer about personhood (Baker, 2000). In the weak sense, any animal that experiences the world from the perspective of its own needs can be said to have a first-person perspective. But the strong sense of the first-person involves not only experiencing the world from one's own perspective but also being aware of oneself as doing so. We can see all sorts of animals acting to get things that they want. For example, although a dog is aware of wanting the stick, and that the stick is over there, it has no conception of itself as a being that wants the stick. The dog does not think of himself as himself, or of

himself as anything else; rather we may say, the dog is the center of his universe. He experiences things from an egocentric perspective. As such, the dog is a subject even though its lack of a strong first-person perspective means that it is not a person.

A being that has a first-person perspective in the strong sense has a conception of itself as a being distinct from others and possessing a perspective on both them and itself. It is not just to have thoughts expressible using “I” in first-person but also to conceive of oneself as the bearer of those thoughts and to have a perspective or a subjective point of view.

According to Frankfurt, a first-person must have the capacity to think of oneself *as* oneself, and of one’s feelings and thoughts *as* one’s feelings and thoughts (Frankfurt, 1988). This definition by Frankfurt reflects and attempts to assess situations or circumstances of personhood. In this sense, we could say that personhood is what marks a person off from everything else in the world. Personhood is about a complex mental property, i.e., a first-person perspective that enables one to conceive of one’s body and mental states as one’s own.

Man Created in the Image of God (*Imago Dei*)

From the biblical view, personhood is the unity of the spiritual and corporeal in human existence. Therefore, the question of what human beings are according to the Christian must be answered biblically. The book of Genesis, chapter one, portrays human beings as part of the material world created by God beyond the material world. As a result, all creations must follow the natural order and have the longing of a creature for a relationship with God. The biblical notion of personhood is the belief that human beings are created according to the *Imago Dei*, the image of God (*Authorized King James Bible Version*, 1611/2008, Gen 1:26-27, James 3:9).

Paul the Apostle wrote in Romans 12:1-2 and I Corinthians 15:45 about humanity and the image of God. The biblical conception of the heart (Hebrew *leb* and Greek *kardia*) implies

the integration of the mind, emotion, will, and body of a human being (*Authorized King James Bible Version*, 1611/2008, Prov 4:23, 27:9, Deut 6:5, Rom 2:29, II Cor 3:3).

The dominant Western interpretation of the image of God has resided in the rational nature of human beings, their dominion over the earth, freedom, and relationships with God (McGrath, 2016). The image of God is not a photo printed on paper but it is more like an image reflected in a blurry mirror. Human beings always correspond to God in a relationship. God intends humanity to be like Jesus Christ because He is the only true and perfect image of God (*Authorized King James Bible Version*, 1611/2008, 2 Cor 4:4; Col 1:15). The form of human life in Jesus Christ is the ultimate definition in the Christian perspective of what is to be genuinely human. In the Christian perspective, faith, theology, and the life, death, and resurrection of Jesus constitute the decisive norm of both true divinity and true humanity.

Research Methods

This article employs a literature study. By accessing various sources, we evaluate, reexamine, and provide analysis and consideration to obtain a better understanding of the topic.

Results and Discussions

AI and the Possibility of Personhood

According to Huang's classification of AI, there are three types of AI: mechanical AI, thinking AI, and feeling AI (Huang & Rust, 2021). Mechanical AI is used to automate repetitive roles, tasks, or activities. Thinking AI is used to process a massive amount of data to solve cognitive problems, produce recommendations, or make decisions. Feeling AI is used to analyze, learn, and respond as humanly as possible to human interactions and emotions. This AI classification mimics human nature and capabilities, which raises the question, "What are the nature, capabilities, and qualities of personhood?"

The central importance of the Christian perspective of human nature is in Genesis 1:27, which speaks about Adam, the first human being, made in God's image and likeness.

This idea of God's image and likeness is often referenced in the Latin phrase *Imago Dei*. Thus Christian perspective sees humanity relates to God as His highest creation.

According to McGrath, in the early Christianity period, there was a division between the "image of God" and the "likeness of God" (McGrath, 2016, p. 327). For Tertullian of Carthage (160-220 BCE), humanity still possessed the image of God even after the fall of man and would be restored through the work of the Holy Spirit. The human state of "God's image" relates to God's form, while "God's likeness" relates to God's eternity.

For Origen (185-254 BCE), humanity received the image of God, but due to the fall of man, the fulfillment of the likeness would be reserved for the final consummation. The possibility of perfection was given to humanity at the beginning by God's image dignity, then at the end of time, God's works will perfect the likeness of God to humanity.

From this first approach by Tertullian, and Origen, if an AI is considered as a God's creation, has God's dignity or the image of God, God's form, and God's eternity, can receive the Holy Spirit, be ultimately perfect in doing its tasks, and relate with God, then AI can be considered to have *Imago Dei* (McGrath, 2016, p. 327-328).

The second approach to humanity is related to the human rational capacity, which reflects the wisdom of God. Augustine of Hippo (354-430 BCE) believed that ratio is what distinguishes humans from animals. He believed that humans could use intelligence to judge behavior, and have the renewed knowledge to relate with God.

Lactantius (250-325 BCE) argued that humans could have the original uprightness and dignity of human nature. He argued that a human being is created by God, and a human has a common identity and dignity with all human beings, leading to political doctrines of human rights, responsibilities, and relationships.

The concept of the image of God relates directly to the doctrine of redemption. The consummation or fulfillment to become the likeness of God, in a perfect relationship with

God, will culminate in immortality. Athanasius (293-373 BCE) taught that humanity was bestowed with a unique capacity that no other creature has, that is, the capability to perfectly relate with God and share in the joyful life of God.

From the second approach, if an AI has the rational capability, can judge its own behavior, can renew its knowledge, can relate to God, has the original uprightness, has dignity and the identity of human nature, has political rights, can bear responsibilities, can relate to other beings and God, and can receive redemption, have immortality, and partake in the life of God, then AI can be considered to have Imago Dei (McGrath, 2016, p. 328-329).

The third approach is that humanity as the image of God should be free from all weaknesses, infirmities, and death. Cyril of Jerusalem (313-386 BCE) stated that the image of God in mankind has been defaced and disfigured since the rebellion of humans from God. Human suffers weaknesses, infirmities, and death as the consequence of the distorted image of God. The perfect image of God means completeness, perfection, and eternal life.

From the third approach, for an AI to be recognized as Imago Dei, AI must be free from all weaknesses and disabilities, immortal, able to choose to follow God's commandment, and able to disregard the material world (McGrath, 2016, p. 328).

Body, Soul, and Free-will

Body

According to the Bible, God created the first human using preexistent materials available on earth, then breathed the breath of life into the human's nostril. Berkhof stated that man's creation was initiated by divine counsel, designed according to a divine form different from the other creatures, formed by the immediate action by God Himself, that it had both body and soul elements, and was then placed in a graced position as the peak of creation to biologically multiply and manage the earth.

From the first approach, for an AI to be classified to have body traits similar to humans, the AI should possess material or physical form and show the biological signs of life, such as being able to respond to the environment, reproduce and pass traits to offspring, grow and change, respire and have metabolism, manipulate energy to build and maintain inner cells, self-preserve, and maintain homeostasis.

From Berkhof's approach, for an AI to be classified as having body traits similar to humans, the AI should be well considered by a counsel of highly intelligent beings, directly made by the highly intelligent beings, designed after its creator type, and have body and soul elements, be able to biologically multiply, and be placed in a managerial position to control other creations (Berkhof, 1949).

Laidlaw believed that the body is not the slave of the soul or its prison-house, despite the current human body being mortal and corruptible (Laidlaw, 1879). The body is the outward and visible design of the inward and spiritual mind. Christians believe that there is a natural body and a spiritual body, where the natural body shall perish in death, and the spiritual body can live eternally after the resurrection.

Soul

The second question is, what is the nature of the human soul? This question can be expanded into, will AI eventually have a soul? If so, where does the AI soul could come from, and can an AI eventually have free will? Augustine, one of the early church fathers, called for cautious openness about the dichotomy of body and soul in man as the image of God (Berkouwer, 1962; Hill et al., 1990).

There are two conceptions of humans in Christian circles. The first conception sees humans as two distinct parts, or a dichotomy: body and soul. The second conception sees humans as three distinct parts, or a trichotomy: body, soul, and spirit.

In trichotomy, the relationship between body and spirit is considered like the material universe and God. Between body and spirit, the soul is needed as the bridge between the material world and the immaterial world. The soul is regarded as both immaterial and material adapted to the body. As the immaterial, the body is regarded as immortal, but as the material, the body is regarded as mortal and carnal. As the material part of the human, the soul is the element that also exists in animal life. As the immaterial part of the human, the soul is the element that shows the God-related rational and immortal part of humans.

Clement of Alexandria, Origen of Alexandria, Gregory of Nyssa, and Apollinaris of Laodicea held the trichotomy view to describe the soul. Augustine of Hippo, the Latin Church, Roman Catholics, and the Reformation hold the dichotomy view to describe the soul. Nineteenth-century theologian Delitzsch conceived of the soul as a breathing process within humans to remove bad things from life. Beck, Oehler, and Heard regarded the soul as the point where the body and the spirit meet.

Louis Berkhof insisted that according to the Bible, human has unity, and not duality (Berkhof, 1949). He believed that human does not consist of two separate elements in a single organism that move along parallel lines forever. Every act of a human is the act of the whole human. When a man sins, the whole man sins. When the man dies due to sins, the whole man dies. When Christ redeemed a man, the body and soul of the man were redeemed.

Berkhof believed that the soul is the most important part of humans, and every human has similar physical, physiological, and emotional needs, along with moral and mental capacities that belong exclusively to man (Berkhof, 1949). The human soul is endowed with intelligence, self-consciousness, freedom, conscience, and religious aspirations (Berkhof, 1949). The highest aspiration of a human soul is to find a relationship with a Higher Being.

Origen theorized that souls pre-exist before the creation of mankind, then transmigrate through the human race. Jerome and Hilary of Pictavium from the Eastern Church theorized

that God creates a new unique soul for every individual birthed (McGrath, 2016). Tertullian from the Western Church theorized that God created the first soul when Adam was created, then enabled the propagation of human souls when humans multiplied. Each of the above theories has its popular term: pre-existentialism, creationism, and traducianism.

Augustine and earlier Scholastics believed that God created souls and infused them into the body. Thomas Aquinas believed that the soul is not generated and then transmitted into the body. Luther had a similar opinion with Tertullian, while Calvin had a similar opinion with Jerome and Hillary. Edwards and Hopkins favor Tertullian's theory while Mueller favors Origen's theory (McGrath, 2016).

Dorner suggests that each of the three theories discussed above represents a facet of the whole truth. While pre-existentialism represents individual self-consciousness or personal eternal divine thought, creationism represents God-consciousness, and traducianism represents generic consciousness.

Thus, an AI that can have self-consciousness that exists before its physical, moral, or material creation can be said to meet the criteria of having a soul according to pre-existentialism. An AI that has generic consciousness that is initially given by the creator of its predecessor, then propagated or transmitted along with its body from its parents, can be said to possess a soul according to traducianism. An AI that has immediate consciousness from its creator, is created as pure and pre-formed as a physical body, and acquires life, can be said to possess a soul according to creationism. All three of these types of theories imply that an AI that has consciousness must have guilt and be able to bear sin created by the mistakes done by AI itself.

For Augustine, the human will and mind are affected by sin as the consequence of the Fall. He believed in making humans unable to diagnose their illness adequately, or cure it because humans have no control over their sinfulness. The nature of original sin is disease,

power, and guilt. By Augustine's criteria, an AI that has the will and mind affected by sin, indicated by the presence of disease, power, and guilt, can be said to have a soul.

Pelagius believed that humanity is obliged to be sinless and without failure. By Pelagius' criteria, an AI that has control of its flaws and weaknesses, including the flaws and weaknesses instilled by its creator or inherited from its predecessor, can be said to have a soul.

Free Will

Free will itself is not biblical and was introduced by Tertullian as a theological term (McGrath, 2016, p. 330). Augustine of Hippo stated that human beings do not do something because that something is necessary but because humans have the freedom to do it. He believed that because human free will has been weakened and incapacitated due to sin, human requires divine grace to restore and heal it. Using an analogy of a pair of scales, the human free will weighs up arguments in favor of doing good, but due to the human free will has become biased toward evil due to sin, the human will tends to act evil accordingly.

Augustine stated that sin arises when humans abuse free will and that every human is born with sin since the fall of humanity. He stated that every human has transmitted guilt because every human in nature feels and is made liable to punishment and death. Gregory of Naziansus (329-389 BCE) and Gregory of Nyssa (335-394 BCE) taught that babies are born without sin.

Augustine saw humans as somehow mystically included in the transmitted guilt, morally weak, and sinful within nature. He believed that God's sovereignty, human responsibility, and freedom must be inseparably upheld at the same time. At the same time, there were two other thoughts considered heresies: Manicheism and Pelagianism. Manicheism upheld the sovereignty of God but did not believe in human freedom. Pelagianism upheld the total freedom of humans but did not believe in the sovereignty of God.

From Naziansus, Nyssa, and Augustine's point of view, for an AI to be considered equal to fallen humanity, an AI must be able to bear responsibility, possess the freedom to have and execute its own will, sin and have a bias toward selecting an evil choice, have guilt and submit to God's sovereignty.

Pelagius and Julian of Eclanum (386-455 BCE) believed humanity has total freedom of will and is responsible for its very own sins. God, being perfect in every way, made very well-created free humans without defects or imperfections. Any imperfection in humanity means God's goodness is not perfect. Direct intervention in human decisions is equivalent to compromising human integrity. Humans do not need divine grace, intervention, or correction, because human free will is in perfect equilibrium and not subject to any bias whatsoever. Therefore humans must bear the consequences for any defect or sin committed themselves.

God creates humans and knows their capacity, capability, and every aspect of mankind. God has given humans commandments possible to be obeyed, and He wanted the commandment to be obeyed by humans. God made human nature and only demands what humanity can endure. For Pelagius, perfection is possible for humanity and it is obligatory.

From Pelagius' view, by replacing the word "human" with "AI" and replacing God with human creators, AI can very well be created free from any defect or imperfection, if humans as AI creators are perfect. Any defect in AI mirrors the imperfection of humans as the creators of AI. Direct intervention in AI is equivalent to compromising AI's integrity.

A perfect AI does not need any intervention or correction, because a perfect AI does not have any bias whatsoever. A perfect AI must bear the consequence of any mistake committed by AI. If humans managed to create a perfect AI and know its capacity, capability, and every aspect of it, the perfect AI would be obliged to do the perfect things with the perfect outcome.

Conclusions

In the narrow simplification, there are three approaches to defining the possibility of personhood: as God's creation who can relate with a God that has dignity, form, and eternity; as the possession of human rational capacity that can relate with God; and as the absence of weakness, disabilities, death, and a material world that can choose to follow God's commandment. These approaches deserve further testing and exploration within various strong AI applications and models, whether an AI actually can satisfy at least one of the approaches, or the AI is simply programmed to mimic the fulfillment of the approach. The simplified criteria should be tested to find if can fully represent the whole idea of personhood stated by each approach.

To define the criteria of a human body, there are three simplified approaches: having a physical or material form that shows biological signs of life; being created in biological form by highly intelligent beings for managing other creations; being mortal, intelligent, physically visible, having a spiritual mind, and being able to be resurrected in an immortal form at the end of time. These simplified criteria need to be tested for their adequacy to define an actual strong AI that might not possess biological or physical form, yet can show the existence of all other criteria. Although it might seem far-fetched, these simplified criteria might also be tested to define the human body of clones or creatures that possess the said qualities.

In simplified terms, to be considered as having a soul, a creature should possess eternal self-consciousness, original consciousness transmittable to its offspring, or immediate consciousness given by its creator. For a strong AI to be categorized as having a soul, it must show that it can have guilt, be able to bear the concept of sin, be able to bear the consequences of the disease, and lack physical immortality. From another view, a strong AI must be able to control its flaws and weaknesses, then choose to correct and do the morally right things

without supervision. The simplified terms need to be tested on multiple levels and scales of strong AI application, to see whether the hypothetical existence of consciousness can be proven of its existence according to the Christian perspective.

To define the existence of free will within a creature, it must be able to bear responsibility, choose its own will, understand the bias of a choice, have guilt, and submit to God's command. On the other end of the scale, free will within a creature can be represented by the perfect actions, performance, and results of the creature without the need for external intervention. Future research direction should be aimed to see the existence of these traits within a strong AI, and whether the algorithm within the AI produces such traits by design or by accident.

Bjork argues that our value to God is not based on anything intrinsic to us (Bjork, 2008). Our value as humans cannot be undermined by the artificial person's existence or actions, and cannot be understood without reference to God. Strong AI, if it hypothetically exists, shows us that humans should hinge their worth and purpose according to God's view.

Different from humans that do not always do things because of necessity, AI is created to do things because there is a necessary thing to do. If humans' free will has been weakened or incapacitated, AI's will is not weakened or incapacitated. While humans will weigh up arguments about doing good or evil before they act, AI will weigh up benefits and disadvantages according to algorithms before it acts. Humans will tend to choose evil due to transmitted sin, but AI will not have such a tendency because AI has no sin despite having flaws and weaknesses.

At the moment of this paper being written, there is no AI that meets the criteria of personhood from the Christian perspective. From the literature discussed, the Christian perspective sees that nothing, including AI, can replace or supersede the image of God in which human beings are created.

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Ranking of the Support Criteria Employees' Productivity Improvement When Working from Home

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Abstract

Covid-19 has affected the world, and its impact is not limited to medical and health aspects. It has also affected social, educational, business, economic, and work environments. The spread of the virus has forced most companies to implement work-from-home (WFH) policies to reduce the mobility of employees and curb the virus's spread, despite potential adverse effects on employees' productivity and performance. This research aims to rank the criteria for improving employees' productivity during WFH using the Fuzzy-Analytical Hierarchy Process (AHP) method. Four criteria and eight sub-criteria were identified to promote employees' productivity. The four main criteria are Income, Work Schedule, Work Environment, and Work Partner. Data processing results show that these criteria rank from top to bottom as follows: Work Schedule, Work Environment, Work Partner, and Income. We hope that the rankings observed in this research will help managers set policies to increase their employees' productivity when working from home.

Keywords: *productivity, working from home, and fuzzy-AHP*

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Ranking of the Support Criteria for Employees' Productivity Improvement When Working from Home

The Covid-19 virus originated in Wuhan, China, and has now spread to every corner of the globe. The pandemic primarily affects the world's health and medicinal systems, and consequently weakens other aspects such as business, economics, society, and the working environment. An observable and significant change in the working environment is the concept of working from home (WFH). A key aspect to maintain in this WFH system is productivity.

The productivity of an employee or worker has a broad range of definitions but includes the means of an individual's efficiency and is an essential factor in the systems of organizations or societies (Ma & Ye, 2019). Evaluating employee performance is expected to contribute to the improvement of a company's productivity and ultimately enhance its competitiveness against other companies that do not pay attention to their human resources.

During this pandemic situation, most employees are obligated to work remotely from their own homes. However, this policy may result in employees' underperformance due to various technical or behavioral factors. One factor that can represent employees' productivity is their attendance or absence, which is often used as a measure of productivity (Ma & Ye, 2019).

The purpose of this work is to rank various criteria that support the improvement of employees' WFH performance and productivity using the standalone Analytical Hierarchy Process (AHP) method, which tends to be subjective. The implementation of the Triangular Fuzzy Number (TFN) approach in AHP method complements the decision-making process mathematically, which is called Fuzzy-AHP.

Literature Review

During this pandemic, companies are striving to compete with each other to survive the situation and are taking any chance to maximize their profits. Their efforts aim to secure the health of their financial structures. Productivity is used to define the quantifiable utility of an activity in the context of maximizing a company's financial gain (Mittal et al., 2017).

An employee is a component of the company's human resources and is a primary input in the whole production system. Employees are the most essential determinant of the growth of a company or institution. Forming a decent group of human resources requires a proper selection process according to the desired characteristics in a particular department. Florez and Cortissoz (2017) mentioned that one strategy to improve the productivity of an institution is to group the workforce in a certain way.

Having a group of qualified members assures an increase in the company's profits. A proper selection and qualification process produces a group of employees with higher education levels who can provide suggestions or input to their superiors, despite there still being errors (Call et al., 2017). They can better identify and solve problems than a group of employees with minimal education (Call et al., 2017).

In this context, the employee is regarded as a productive human resource asset instead of a burden held by the company. Moussa and Arbi (2020) defined the values of qualified employees as: having adequate knowledge and skills, being creative, and maintaining good health. They added that in order to improve employees' productivity, the employees have to possess substantial working skills and a positive psychological mindset concerning their lifestyle, motivation, and cognitive skills. Thus, the employee is the main key to achieving a successful and productive company or institution. Every company strives to ensure that its employees hold

a purpose in their work-life balance and that its employees' performance reflects a sense of purpose, satisfaction, and happiness, for a contented employee is more likely to perform well and be more productive than the opposite (Adhikari et al., 2017).

Adhikari et al. (2017) remarked that a work environment conducive to a comfortable atmosphere produces advantages for the company to grow its value, productivity, and profitability. Burdin and Perotin (2019) argued that from the employee's perspective, flexible work scheduling that allows the employee to vary their working time according to their personal needs may induce better work-life balance, comfort, and contentment. Collewet and Sauermann (2017) expressed that alternating work schedules or work shifts enables the company to assess variations to measure the influence of an employee's work schedule on their productivity.

AHP is a reliable method to analyze the options when making decisions with multi-criteria (Lin & Kou, 2020). The AHP method helps break down the decision problem into a hierarchy involving multiple criteria and sub-criteria, hence describing the priority and level of importance of the issue. The AHP is often used for its flexibility, systematic approach, and straightforward hierarchy presentation (Hu et al., 2021). Its advantage also lies in its fair analysis, flexibility in regard to integration with varying evaluation factors, and logical classification system. The method has been further advanced, and Lyu et al. (2020) declared fuzzy logic as one prevalent method to deal with unclear and uncertain issues in the AHP method, which incorporates fuzzy logic into its framework.

Fuzzy logic was first introduced by Professor Zadeh (Zadeh, 1965) to explain a vague real-life phenomenon mathematically (Li et al., 2019). Fuzzy logic describes a free-range structure and estimation model with an approach of a function modified by the association of linguistic input and/or output. The application of fuzzy logic facilitates the processing of a

system with difficulties in the modeling, vagueness in the information, or too much human control. Ly et al. (2018) are convinced that applying fuzzy logic in the analysis achieves better accuracy and accordance to the data and theory than conventional methods do.

Research method progress has brought about the integration of the AHP method and fuzzy logic to minimize the uncertainty in the employment of the AHP method alone. Bologna et al. (2018) exhibited a model to rank criteria by using the AHP method based on the scaling benchmark as the inferences from the fuzzy logic method, then this method was associatively performed great in a fuzzy system presented in it. The integration of the AHP method and fuzzy logic allows better efficiency in determining a priority. It is especially reliable in the case of multiple and varying information or inputs to consider in decision-making (Tyagi et al., 2017). Fuzzy logic completes the standalone AHP method, which tends to be subjective. The implementation of the TFN approach complements the decision-making process mathematically.

Methods

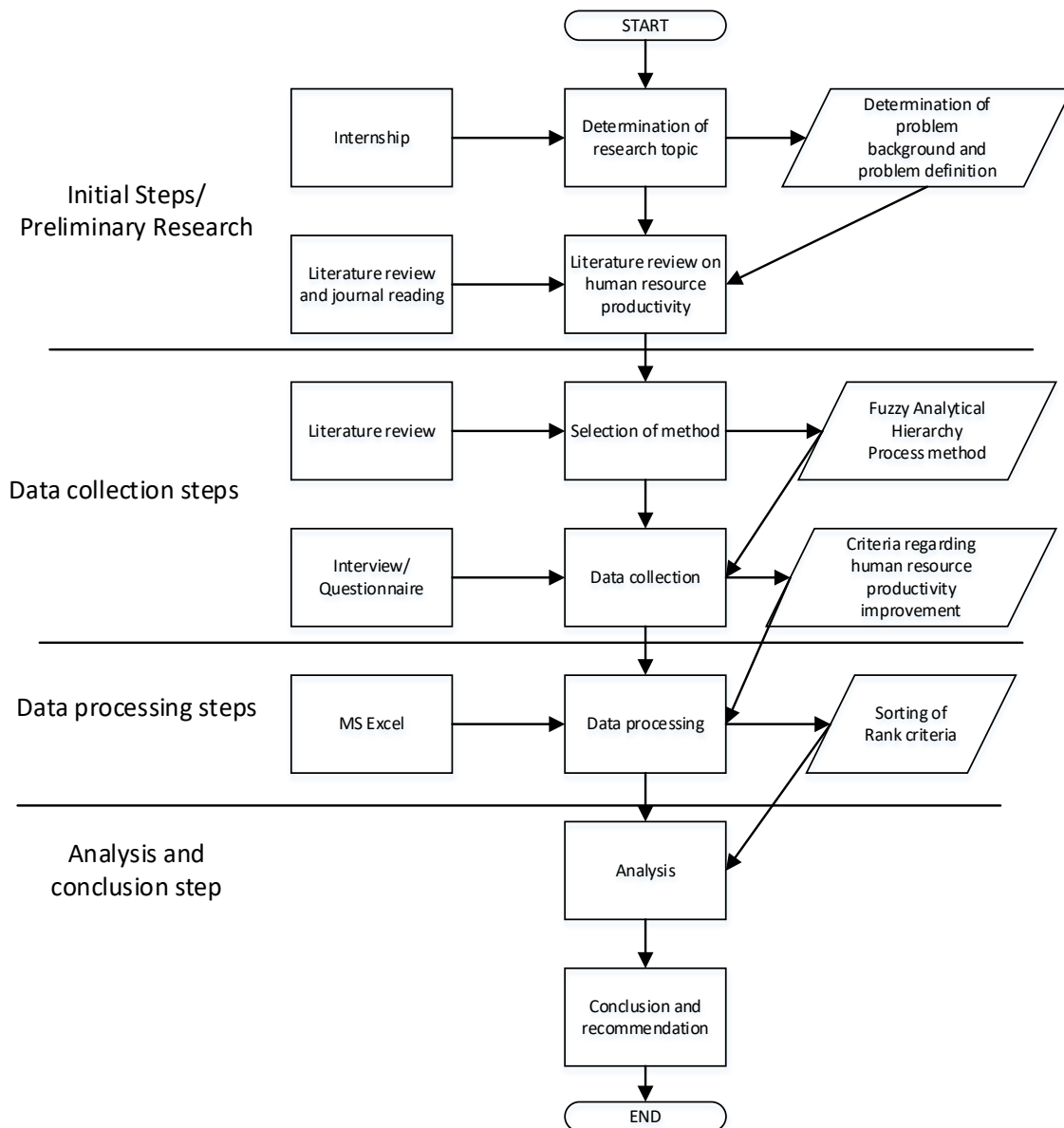
Based on the research objective, this is exploratory research aimed at extracting all the information necessary to define the problem's basis. In application, , that we using this method to achieve where the output will be implemented to solve the existing problem (Kuntjojo, 2009). This work follows a cross-sectional research design, collecting data at a single period and observing the variables in a particular time frame for a short duration. In terms of data collection techniques, we measured the research problem quantitatively and converted the data into mathematical and statistical measures for analysis.

Figure 1 displays the workflow of the entire process. Initially, we formulated the research topic, problem background, problem identification, and problem definition. Next, we studied human resource productivity through a literature review and journal reading. Then, we

determined the method to answer the research problem, and we proposed the Fuzzy-AHP method. We collected data about the criteria affecting work productivity through interviews with stakeholders and a questionnaire survey. The data was processed using MS Excel to rank the criteria affecting work productivity, and it was then analyzed further. Finally, we provided conclusions and recommendations based on the analysis.

Figure 1

Research Flowchart



Participants/Sample

The data were obtained through interviews with participants at three levels of workers: top, middle, and low from Company X. The objective of this research is to contribute to the decision-making process of the company's management by considering the criteria affecting employee productivity and improving it.

Data Collection

Initially, we conducted interviews with the Human Resource Department (HRD) personnel of Company X to identify the key performance index (KPI) of the company. This revealed three values: (1) the KPI, which describes the relationship between each department and its subordinates; (2) competency, which describes the value of an employee's soft skills; and (3) the leadership value possessed by personnel. We collected data on the issues in each department by conducting literature reviews, interviews, and questionnaires, after extracting information on support criteria from experts. We designed the questionnaire based on the gathered information and spread it to the experts, or heads, of the respective departments. The details of the AHP questionnaire steps are as follows:

1. The questionnaire consisted of an evaluation of the criteria that can improve Company X employees' productivity, according to the results of interviews with experts in Company X.
2. The questionnaire was distributed to the three groups of participants in this study to obtain the best and most accurate results.
3. The leader or head of the department was instructed to answer the questionnaire regarding the criteria according to five priority scales such as : Extremely important, Very strongly important, Strongly important, Moderate important, Equally important)

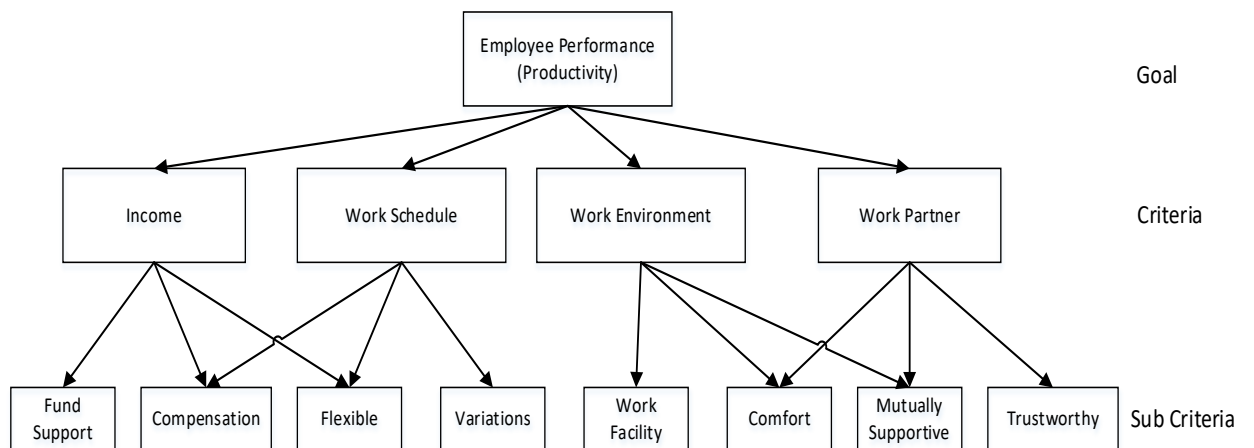
using the Fuzzy-AHP method. Each answer would be marked to access the information later.

Data Analysis

Based on the questionnaire answers, we identified four criteria for this case such as: Income (I), Work Schedule (WS), Work Environment (WE), and Work Partner (WP). Eight sub-criteria were also identified, including Fund Support/Aid (FS), Compensation (C), Flexible (F), Variations (V), Work Facilities (WF), Comfort (Com), Mutual Supportive (MS), and Trustworthy (T), as shown in Figure 2.

Figure 2

Goal, Criteria, and Sub-Criteria



The results obtained from the questionnaire were compared with each other and arranged into a pairwise comparison matrix based on TFN for scaling. The TFN settings are shown in Table 1.

Table 1

Triangular Fuzzy Number

Scale of Interest	Fuzzy Number	Linguistic Variable	Membership Function
1	1	Equally important	(1,1,1)
3	3	Moderate important	(2,3,4)
5	5	Strongly important	(4,5,6)
7	7	Very strongly important	(6,7,8)
9	9	Extremely important	(9,9,9)

Note. Source: Buckley (1985)

After obtaining the fuzzy numbers, the defuzzification process was initiated to generate quantifiable results from the fuzzy numbers and obtain crisp output values. This research followed the centroid method to convert fuzzy numbers. We calculated the eigenvalues of the crisp values to determine the weight/scale of the criteria. Additionally, the values were tested for consistency to examine the reliability of the obtained data. Inconsistency would indicate the need to collect data again to achieve consistent results.

Results and Discussion

The information obtained from the proper respondents was presented as a pairwise comparison matrix. The results are displayed in Tables 2, 3, and 4.

Table 2

Criteria Assessment of Respondent 1

Respondent 1	Income			Work Schedule			Work Environment			Work Partner		
I	1	1	1	1/6	1/5	1/4	1/4	1/3	1/2	1/6	1/5	1/4
WS	4	5	6	1	1	1	2	3	4	1	1	1
WE	2	3	4	1/4	1/3	1/2	1	1	1	1	1	1
WP	4	5	6	1	1	1	1	1	1	1	1	1

Table 3

Criteria Assessment of Respondent 2

Respondent 2	Income			Work Schedule			Work Environment			Work Partner		
I	1	1	1	1/4	1/3	1/2	1/8	1/7	1/6	1/6	1/5	1/4
WS	2	3	4	1	1	1	1	1	1	1/4	1/3	1/2
WE	6	7	8	1	1	1	1	1	1	1	1	1
WP	4	5	6	2	3	4	1	1	1	1	1	1

Table 4

Criteria Assessment of Respondent 3

Respondent 3	Income			Work Schedule			Work Environment			Work Partner		
I	1	1	1	1/6	1/5	1/4	1/4	1/3	1/2	1/6	1/5	1/4
WS	2	3	4	1	1	1	2	3	4	1	1	1
WE	1	1	1	1/4	1/3	1/2	1	1	1	1	1	1
WP	1/6	1/5	1/4	1/8	1/7	1/6	1/4	1/3	1/2	1	1	1

After obtaining the fuzzy values for the three respondents, then we proceeded with the calculation of defuzzification, or of changing the fuzzy value to a crisp value. In the defuzzification step we used the centroid method, using this formula:

$$\frac{1+4*1+1}{6}$$

An example of a defuzzification table from respondent 1 sub-criterion P is shown in Table 5.

Table 5

Example of the Results of Defuzzification of Respondent 1 Sub-Criterion P

I	FS	C	F
FS	1	5	3
C	0.20	1	1
F	0.35	1	1
Total	1.55	7	5

Next, the final calculation using the Fuzzy-AHP method concluded the rank of the support criteria affecting productivity from the largest weight to the smallest weight: Work Schedule (0.39), Work Environment (0.28), Work Partner (0.22), and Income (0.11).

According to the results, Work Schedule was the most important factor that should be followed by every employee. The work schedule is established by the company according to its capability with the purpose of achieving the expected output. In this work, we compiled three sub-criteria to augment the Work Schedule criteria. Our analysis concludes that the weight of the three sub-criteria from highest to lowest was as follows: Flexibility (0.44), Compensation (0.39), and Variations (0.19). Flexibility ranks highest considering WFH policies and the prevalence of technology (internet connection, Wi-Fi, video conference) allows remote group work. Flexibility in the work schedule reduces some work stress and pressure for the employees and grants them more comfort to finish their work according to their work target. Compensation can serve as an incentive for employees to increase their productivity, such as through financial rewards for overtime work.

The second-ranked criterion was Work Environment, which considers the situation and facilities in the workplace that can improve the mood and comfort of an employee. A good setting is expected to promote the employee's productivity in positive ways. Three sub-criteria supporting the Work Environment are Work Facility (0.37), Mutually Supportive (0.35), and Comfort (0.28). Remote work requires proper technological accommodations, such as Wi-Fi, modems, routers, laptops, PCs, related software, and licenses.

Work Partner was ranked third in productivity improvement criteria, considering the ease of establishing connections with desired coworkers during isolated work conditions, compared to the normal situation where employees may be separated by work department, workplace, or

simply by time or attendance. The sub-criteria in this element are Comfort (0.61), Mutually Supportive (0.20), and Trustworthy (0.19). Establishing a comfortable connection with a work partner enables cooperation and improves the contributions of both employees in their work; thus, it helps to promote better total productivity despite employees working in separate places.

Income was the least important factor regarding productivity improvement. This may be used as another option when employees achieve their target and perform well. It can be evaluated by assessing the Work Schedule and Work Partner factors. The rank of Income sub-criteria was Fund Support/Aid (0.66), Compensation (0.18), and Flexibility (0.17). The following is the scaling of criteria and sub-criteria according to the Fuzzy-AHP method, as shown in Table 6.

Table 6

Results of Fuzzy-AHP Method

Rank	Criteria	Sub-Criteria	Weight	Rank
1	Work schedule (0.4)	Flexibility	0.44	1
		Compensation	0.39	2
		Variations	0.19	3
2	Work environment (0.27)	Work Facility	0.37	1
		Mutually Supportive	0.35	2
		Comfort	0.28	3
3	Work partner (0.22)	Comfort	0.61	1
		Mutually Supportive	0.2	2
		Trustworthy	0.19	3
4	Income (0.11)	Fund support	0.66	1
		Compensation	0.18	2
		Flexibility	0.17	3

Conclusion

Our study utilized the Fuzzy-AHP method to analyze multiple factors affecting employees' productivity improvement in Company X. Our findings suggest that the Work Schedule criterion holds the most significant weight (0.39) in improving employee productivity

during the WFH situation, followed by the Work Environment (0.28), Work Partner (0.22), and Income (0.11) criteria.

A flexible work schedule allows for appropriate work hours during WFH, while providing amenities such as laptops and internet connection contributes to a better work environment and employee comfort. Establishing a positive connection with the right work partner also promotes better comfort for employees. As for the Income factor, allocating fund support/aid can encourage employees to perform better and be more productive. In summary, our research indicates that improving the Work Schedule, Work Environment, and Work Partner criteria can effectively enhance employee productivity in Company X during the WFH situation.

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