

DESCRIPTION OF CLINICAL POLYPHARMACY PRESCRIPTIONS IN TYPE 2 DIABETES MELLITUS PATIENTS AT HOSPITAL X JEMBER DISTRICT

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ABSTRACT

Diabetes mellitus (DM) is a metabolic disease caused by insulin resistance and pancreatic beta cell dysfunction. Polypharmacy is the use of three or more drugs every day is very common in patients with diabetes mellitus. WHO data shows that the prevalence of Diabetes Mellitus (DM) polypharmacy will reach 7.4% - 43.4% by 2023. This study aims to determine the clinical picture of polypharmacy prescriptions in patients with type 2 diabetes mellitus at X Hospital, Jember Regency. This study used a descriptive non-experimental method by observation, involving 80 samples. Samples were selected by random sampling and data were analysed and displayed in the form of frequencies and percentages using Microsoft Excel and SPSS. The results of this study are the description of the most polypharmacy prescriptions, namely prescriptions with 3 drug items as many as 3 prescriptions (7.5%), and the description of the least polypharmacy prescriptions, namely prescriptions with 4 drug items, and prescriptions with 10 drug items as many as 1 prescription (1%). In addition, the results of this study also contained drug interactions as many as 72 interacting prescriptions. From the discussion above, it can be concluded that, in the study at Hospital X, Jember Regency, polypharmacy was found from the samples analysed, all of which were polypharmacy prescriptions. This study also found that prescriptions for type 2 diabetes mellitus patients experienced drug interactions with moderate interactions being the most common. These interactions can reduce the effectiveness of treatment and increase risks for patients.

Keywords: Recipe, Polypharmacy, Type 2 Diabetes Mellitus, Hospital.

INTRODUCTION

Diabetes mellitus is a metabolic disease caused by insulin resistance and pancreatic beta cell dysfunction. This disease often arises due to people's lifestyles that are less aware of the importance of early detection, lack of physical activity, and unhealthy diets. An unhealthy lifestyle, including diet and physical inactivity, can be a major factor in the development of diabetes mellitus. Unhealthy eating habits and lack of physical activity increase the risk of developing type 2 diabetes mellitus (Rindarwati et al., 2023).



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Patients with diabetes mellitus are often accompanied by comorbidities, either complications of diabetes mellitus or other diseases, so that more drugs are used. The use of these drugs is not only to treat type 2 diabetes mellitus, but also drugs to treat comorbid diseases. This causes patients to receive polypharmacy, one of which can potentially cause drug interactions (Saibi et al., 2020).

Polypharmacy is a condition in which patients take three or more medications daily. Patients who experience polypharmacy are at high risk of drug interactions that can have a significant clinical impact. Polypharmacy is often found in patients with diabetes mellitus who also suffer from comorbidities or complications, as these conditions require very specific treatment and tend to require more drugs. Polypharmacy usually leads to drug interactions (Sengaji et al., 2023).

According to WHO data, the prevalence of polypharmacy in the world in 2023 will reach 7.4% to 43.4%. Hutahean's research in 2020 showed that out of 131 polypharmacy prescriptions analysed, 60 of them interacted with other drugs. According to Fitri, Intiyani, and Miyarso in 2022, drug interactions are the body's response that can affect the effectiveness of treatment. Effects that can occur due to drug interactions include decreased therapeutic effectiveness, increased toxicity, and the appearance of unwanted pharmacological effects (Razoki et al., 2023). Along with the risks that can occur due to drug interactions in controlling blood glucose levels, it is necessary to conduct broader research related to drug interactions, especially in type 2 diabetes mellitus patients who are one of the patient groups whose drug use lasts for a long time.

Based on a preliminary study conducted at Hospital X Jember Regency, the data showed that in 2022 there were 400 patients with type 2 diabetes mellitus in the outpatient installation. From this background, the researcher is interested in conducting research on the description of polypharmacy prescriptions in patients with diabetes mellitus at Hospital X in Jember

MATERIAL AND METHODS

This study was conducted at Hospital X, Jember Regency using descriptive non-experimental method with observation. Data were obtained from tracing the prescriptions of patients with type 2 diabetes mellitus through electronic medical records. The study population consisted of 400 medical records of outpatients with type 2 diabetes mellitus from January to December 2022 at Hospital X, Jember Regency. Sampling was done using the Slovin formula and random sampling technique, resulting in 80 patient prescription samples. The instrument used was a recapitulation sheet. The data collected included prescriptions from 400 patients, with a sample of prescriptions that met the inclusion and exclusion criteria. Inclusion criteria in this study included outpatients diagnosed with type 2 diabetes mellitus, either with or without comorbidities and complications, type 2 diabetes mellitus patients who used



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three or more drug items recorded on the prescription, and type 2 diabetes mellitus patients who used oral anti-diabetic drugs. Exclusion criteria were incomplete prescriptions for type 2 diabetes mellitus patients. The patient's prescription was then observed for patient identity such as age and gender, number of drugs, including polypharmacy, and drug interactions checked through the Medscape application. Data were processed using Microsoft Excel and SPSS. Data were analysed univariately to see the frequency and percentage of observed prescriptions for patients with type 2 diabetes mellitus at Hospital X, Jemb Regency.

RESULT AND DISCUSSION

GENERAL DATA

This study was conducted at Hospital X in Jember Regency in April 2024. The aim was to determine the clinical picture of polypharmacy prescriptions in patients with type 2 diabetes mellitus at the Outpatient Installation of Hospital X in Jember Regency. This study has obtained ethical approval with No. 153/KEPK/UDS/II/2024. The following research results based on gender and age characteristics are presented in the table below.

Sampel 1. Frequency Distribution of Research Subjects Based on Gender and Age

Based on the table above, the number of patients with type 2 diabetes mellitus is more female, namely 44 people (55%). This finding is in line with Sengaji's research (2022), which states that more than half of diabetes mellitus patients are women, with a total of 88 people or 58.66% (Sengaji et al., 2023). The results of previous research by Poluan et al (2020) show that female gender is more dominant than male (Poluan et al., 2020). Ezra's research shows that the average number of drugs consumed by women aged 79 and under is higher than that of men in the same age group. The majority of women (36.9%) used 5 or more active drugs while the majority of men (41.2%) used between one and two active drugs (Reinhard et al., 2019). The results of this study are consistent with data from the National Basic Health Research, which shows that more women (1.8%) than men (1.2%) suffer from diabetes mellitus in Indonesia (Kemenkes RI, 2022).

Table 1 shows that the 51-60 years age group had the highest number of patients with type 2 diabetes mellitus, with 35 patients. In contrast, the age groups of 20-30, 31-40, and 81-90 years each had only one patient, making the number very small. This finding is in line with Sengaji's research (2022), which revealed that the majority of diabetes mellitus patients were at the age of 40-65 years, with 96 people or 64% (Sengaji et al., 2023). Ezra's research shows that in each age group, both 60-74 years old and 75-90 years old, more than half of them have the potential to experience intercourse. This is in accordance with research conducted by Frankfort et al where it is said that the elderly often have many diseases so they need a



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combination of several drugs at once and it is noted in other studies that polypharmacy is at high risk of drug interactions. The greater the number of drugs prescribed, the higher the likelihood of interactions between these drugs (Reinhard et al., 2019).

The researcher believes that women are more likely to receive a higher number of drugs than men. In addition, age is also an important factor for polypharmacy or administration of drugs with a large number of drugs because the elderly often have many diseases so they need a combination of several drugs. In addition, after the age of 65 years, the prevalence tends to decrease. In the researchers' opinion, this may be because people aged 65 years or older may be healthier overall than younger people, as they have avoided many serious diseases and health conditions and have chosen healthier lifestyles and fewer risk factors for developing type 2 diabetes mellitus. It may also be because type 2 diabetes mellitus is a chronic disease that can cause serious complications. Many of these complications lead to death before the age of 65, resulting in a decreased prevalence in the older population

Sampel 2. Frequency Distribution Research Subjects Based on Polypharmacy.

Table 2 shows that the most polypharmacy was 5 as many as 31 people (38.8%) and the least was 4 and 10 each as many as 1 person (1.3%). This is supported by Sengaji's research (2022), which showed that of the 150 prescriptions analysed, the majority were in the major polypharmacy category (5-9 types of drugs), with 113 prescriptions or 75.3% of the total included in the category (Sengaji et al., 2023).

This is supported by Bukhoriah Safitri's research which states that the number of drug interactions obtained was 51.66% with an age group of 56-65 years (16.55%), patients with comorbidities (48.34%), and received 5 drug therapies (50.33%). Type 2 diabetes mellitus patients are often accompanied by comorbidities, either complications of diabetes mellitus or other diseases so that the drugs used become more. The use of these drugs is not only to treat type 2 diabetes mellitus, but also drugs for comorbid diseases. This causes patients to receive polypharmacy, one of which can potentially cause drug interactions. When patients receive polypharmacy, various interactions are likely to occur in these patients, including pharmaceutical interactions, pharmacodynamic interactions and pharmacokinetic interactions (Rasdianah & Gani, 2021).

Researchers believe polypharmacy is very common in patients with chronic diseases such as diabetes mellitus. This disease is usually heavily medicated and usually involves a combination of several types of drugs. We support the need for more attention in managing therapy in patients with polypharmacy, especially those with diabetes mellitus, to ensure the effectiveness and safety of treatment.

Sampel 3. . Frequency Distribution of Drug Interactions

Based on the results of table 3, it shows that 72 prescriptions (90%) experienced drug interactions and 8 prescriptions (10%) did not experience drug interactions. This



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is supported by Sengaji et al (2022) who stated that when viewed from the potential for drug interactions, then of the 150 prescriptions studied, the majority of recipes did not occur interactions, namely 112 recipes with a percentage of 74.7% (Sengaji et al., 2023). Potential drug interactions can cause severity which is divided into three categories: mild (minor), moderate (moderate), and severe (major). The study showed that moderate or moderate severity was more dominant, with 86 cases (57.3%), compared to mild and severe severity.

The results showed that the most common drug interactions were moderate interactions, with 53 prescriptions (66.3%), while major interactions were found in only 1 prescription (1.3%). For example, moderate interactions included the combination of amlodipine and metformin. The use of amlodipine together with metformin may reduce the hypoglycaemic effectiveness of metformin (Setyoningsih & Zaini, 2022). Another example is glimepiride and amlodipine. The use of glimepiride together with amlodipine can cause GDS instability where there is an increase that affects the body's metabolism. This is because amlodipine actually increases glimepiride levels, so glimepiride works stronger (Hidayah, 2023). The impact of this potential interaction with moderate severity can lead to worsening of the patient's clinical status, resulting in the need for additional treatment, hospitalisation, or extended hospital stay (Samiyah, 2017).

Drug interactions occur when the effect of a drug is influenced by another drug, food, or drink. In the prescription of type 2 diabetes mellitus in combination with other drug therapies, there is often inaccuracy in drug selection. This may be due to the incompatibility of the mechanism of action of available drugs with the disease pattern in patients with type 2 diabetes mellitus. In addition, the clinical condition of the patient influences the doctor's decision in selecting drugs to ensure therapeutic effectiveness. Complications from co-morbidities in patients with type 2 diabetes mellitus may also cause doctors to prescribe multiple drugs, potentially increasing the risk of drug interactions (Risal et al., 2021).

Researchers believe that drug interactions are a common problem in prescriptions given to patients, especially in patients with chronic conditions such as type 2 diabetes mellitus that require drug combination therapy. Comorbidities in patients with type 2 diabetes mellitus can cause doctors to prescribe several drugs that can cause drug interactions. Therefore, the researchers suggest the need for attention in choosing drug therapy to ensure the effectiveness and safety of treatment for patients.

CONCLUSION

From the discussion above, it can be concluded that, in the study at Hospital X, Jember Regency, polypharmacy was found from the samples analysed, all of which were polypharmacy prescriptions. This study also found that prescriptions for type 2



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diabetes mellitus patients experienced drug interactions with moderate interactions being the most common. These interactions can reduce the effectiveness of treatment and increase risks for patients.

ACKNOWLEDGEMENT

1. For hospitals, to improve the quality of care for type 2 DM patients undergoing polypharmacy, reduce the risk of drug complications, and improve patient compliance and quality of life.
2. For future researchers, further research on the impact of drug interactions and monitoring is expected.

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Tabel 1. Frequency Distribution of Research Subjects Based on Gender and Age

Gender	Frekuensi	Persentase (%)
Man	36	45
Woman	44	55
Total	84	100
Age	Frekuensi	Persentase (%)
20-30	1	1,3
31-40	1	1,3
41-50	8	10
51-60	35	43,7
61-70	27	33,7
71-80	7	8,7
81-90	1	1,3
Total	80	100.00

Table 2. Frequency Distribution Research Subjects Based on Polypharmacy.

Polypharmacy (Polypharmacy with multiple drug items in a prescription)	Frekuensi	Persentase (%)
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3	6	7,5
4	1	1,3
5	32	40
6	18	22,5
7	12	15
8	10	12,5
10	1	1,3
Total	80	100

Table 3. Frequency Distribution of Drug Interactions

Drug Interactiona	Frekuensi	Persentase (%)
Yes	72	90
No	8	10
Total	80	100

