Patients with Polypharmacy and the coproduction of the experience with their Physicians

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Abstract:
In health care, patients’ value depends not only on clinical therapies but also on several non-clinical perspectives, which define whether clinical therapies are going to be beneficiary or problematic. Recently, healthcare research has emphasized to explore non-clinical perspectives in care processes. This research explored non-clinical perspectives of polypharmacy through some patients' and physicians' participation and aimed to illustrate how physicians can reduce cases of polypharmacy or help patients in dealing with the adverse effects of this condition by focusing on non-clinical perspectives of polypharmacy. In this context, this research answered three specific questions: how patients experience consequences of polypharmacy; what causes polypharmacy; and what are the possible initiatives to manage polypharmacy. This research found that several non-clinical factors cause polypharmacy and trigger problematic phenomena in polypharmacy. Accordingly, several initiatives that targeted those factors have been suggested. Those initiatives will likely add value for patients who are in polypharmacy or who are likely to experience polypharmacy. The added value can prevent some potential costs related to the utilization of additional health services and improve care management processes for patients in polypharmacy.

Keywords: Healthcare, Polypharmacy, Non-clinical Perspective, Value for Patients, and Co-production.

1. INTRODUCTION
In healthcare, patients’ value depends not only on clinical therapies but also on several non-clinical perspectives, which define whether clinical therapies are going to be beneficiary or problematic (DADFAR, BREGE, SEMNANI, 2013). In a healthcare context, non-clinical perspectives refer to the elements from social, economic and ecological environments that influence a patient’s care process (DUERDEN, AVERY, PAYNE, 2013). Widely elucidated non-clinical perspectives are patients’ and physicians communication and cooperation, patients’ quality of life experienced in a medical regimen, patients’ financial ability and health care policies or guidelines (DUERDEN et al., 2013; DUFFETT, 2017).

Dadfar et al. (2013) reasoned that, in a care process, the difference between what patients say they want to do and how they put into practice is enormously instructive because the difference illustrates that patients' living environments may constrain or facilitate the adoption of the prescribed care. The role of physicians is to understand those environments and support patients in adopting a care (DADFAR et al., 2013). Duffett (2017) added that whereas healthcare professionals have disease-specific expertise, patients have experience based expertise.
Exploring non-clinical perspectives of care processes can be a driving force in managing polypharmacy. Polypharmacy has commonly been referred to as the simultaneous use of multiple medicines (PAYNE, et al., 2014; ABOLHASSANI, CASTIONI, MARQUES, VOLLENWEIDER, WAEBER, 2017) and has been associated with several adverse consequences.

This research aims to illustrate how clinicians can reduce cases of polypharmacy or help patients deal with the adverse effects of this condition by focusing on the non-clinical perspectives of care processes. In order to do so, it was concerned with understanding, explaining and reporting non-clinical perspectives on care processes relevant to the management of polypharmacy. The research focused on patients who take at least five medications a day and doctors working in the health insurance companies. It is worth mentioning that this research did not interview relatives of patients and others care givers, such nurses. In addition, this research did not explore clinical therapies and their outcomes.

2. LITERATURE REVIEW

2.1. Polypharmacy

In the past, when an apothecary compounded medications, polypharmacy referred to the mixing of many drugs in one prescription (COLLEY, LUCAS, 1993). Today, polypharmacy referred to prescribing too many medicines to an individual (Stedman, Thomas, as cited in COLLEY & LUCAS, 1993). However, the quantitative definition itself may not be sufficient in defining polypharmacy. Duerden et al. (2013) stated the randomness and the changing/fluid nature of the numerical threshold:

Since the number of drugs that patients receive has been rising in recent years, it is possible that the utility of a specific threshold may change over time. For example, four or more drugs was considered high a decade ago, but this is now commonplace and a threshold of ten or more might be more appropriate (p. 5).

The above discussion on polypharmacy revealed that medical literature lacks a clear and uniform definition of polypharmacy. Masnoon et al. (2017) raised the concern that this lack of clarity and uniformity poses challenges for healthcare professionals when they have to assess and consider efficacy and safety issues within a clinical setting.

The heterogeneity creates difficulty in adopting a particular definition. However, in a study, Hovstadius, Åstrand and Petersson (2009) set at least five medications as the occurrence of polypharmacy and 10 or more drugs as excessive polypharmacy, excluding OTC medications. Moreover, devices and externally used substances were excluded (GUTHRIE et al. (2015). They reasoned that the cutoffs are the same in most studies in polypharmacy and thus, this deliberate action will enable comparisons with other studies. This study also aims to compare its findings to that of other studies. Therefore, this study will follow the account of Hovstadius et al. (2009) in defining polypharmacy.

Polypharmacy has been associated with several adverse consequences. Polypharmacy may cause poor medication adherence (GOULDING, 2004; FREI et al., 2001) and has been associated with ADEs (adverse drug events) (BOURGEOIS et al., 2010), outpatient and emergency room visits (BOURGEOIS et al., 2010) and high economic burden (KÖBERLEIN et al., 2013). Nobili et al. (2011) found a positive correlation between polypharmacy and potentially serious DDIs (drug-drug interactions). Additionally, polypharmacy can increase health care costs, requiring additional treatments, which may increase pharmaceutical expenditures or the utilization of health services (BRADLEY, FAHEY, CAHIR, 2012; PAPPA et al., 2011). Moreover, Montiel-Luque et al. (2017) and Riker and Setter (2012) argued that patients in polypharmacy experience poor quality of life including physical and social function.

Known predictors of polypharmacy include clinical and non-clinical factors. Clinical factors are out of the scope of this research and have not been discussed in this literature. An extensive focus has been given to explore non-clinical factors that cause polypharmacy. Some
forms of lifestyle induce polypharmacy: smokers are likely to experience polypharmacy (ABOLHASSANI et al., 2017). Pappa because they are more likely to suffer from multiple diseases, which require multiple medications (PAPPA et al., 2011); obese individuals are more exposed to multiple drug treatments (DEGLI et al., 2006), as soon as obesity can deteriorate individuals’ quality of life and correlate with poor health and many chronic diseases and those conditions will likely require multiple medications and thus induce polypharmacy (PAPPA et al., 2011).

Self-medication induces polypharmacy (ANTHIERENS et al., 2010). Patients received medications not only from their physicians but also from their well-wishers such as friends, relatives or neighbors (ANTHIERENS et al., 2010). Those channels increase the number of medication in addition to prescribed ones. Additionally, self-administered medications may cause side effects or poor adherence to prescribed medicines (ANTHIERENS et al., 2010).

Medication disagreement between doctors and patients is a known predictor of polypharmacy (JUNIUS-WALKER, 2007). Anthierens et al. (2010) reasoned that disagreement usually prevails among patients who follow similar prescriptions for long-term; those patients become stubborn; consequently, prescribers face challenges if they try to reduce the number of medicines. Anthierens et al. (2010) also reported that prescribers’ lack of pharmacological knowledge induces polypharmacy. This finding is also confirmed by Larson (2001).

Multiple providers are likely to induce polypharmacy, since each provider might treat a patient from his or her respective specialty (ANTHIERENS et al., 2010). Consequently, patients are exposed to multiple medications (ANTHIERENS et al., 2010). Larson (2001) added that one prescriber might be reluctant to interfere with the treatment prescribed by another prescriber because of congeniality and thus, the patients’ medication intakes are not optimized and the patients are exposed to polypharmacy.

Herr et al. (2017) argued that types of institutional care might influence the prevalence of polypharmacy. They found that privately cared patients experience lower rates of polypharmacy than publicly cared patients. Moreover, prescribers’ attitude toward polypharmacy may broaden cases of polypharmacy. Larson (2001) mentioned that prescribers consider polypharmacy as a routine approach. Anthierens et al. (2010) mentioned that it is often possible that prescribers do not consider polypharmacy as a critical phenomenon, as they do not pay sufficient attention to it.

Clinicians and healthcare system face challenges to manage polypharmacy, globally (GUTHRIE et al., 2012). Payne et al. (2014) argued that interventions to manage polypharmacy will not only improve clinical outcomes but also reduce costs. Several interventions have been proposed. Guthrie et al. (2015) argued for optimizing medication regimens through regular medications review. Anthierens et al. (2010) emphasized physicians’ due diligence on every prescription renewal. They also advocated for a coordinator to optimize patients medication if multiple providers cause polypharmacy. Moreover, prescriber’s knowledge of pharmacotherapy has also been emphasized. Anthierens et al. (2010) proposed that prescribers’ need training on pharmacotherapy. Guthrie et al. (2015) added prescribers should develop skills in applying the acquired knowledge. Furthermore, Spinewine et al. (2007) proposed a multidisciplinary approach in which prescribers, patient, and caregivers work closely to address the adverse effect of polypharmacy should be a useful intervention. Additionally, Anthierens et al. (2010) argued for prescribers’ behavioral CHANge; prescribers should not consider polypharmacy a routine approach rather they should be proactive in reducing cases of polypharmacy.
2.2. **CoProduction - An Effective Approach to Manage Polypharmacy**

Studies have advocated patients’ and physicians’ participation in exploring non-clinical perspectives of care processes to manage polypharmacy. Duerden et al. (2013) argued that patients should be actively pursued to report their experiences in polypharmacy. Craig (2015) argued that it is essential to reflect what matters to patients when they are in polypharmacy. Anthierens et al. (2010) emphasized the physicians’ participation is essential to record prescribers views on polypharmacy. They added such views will help in understanding the mechanisms underlying their behaviors and promoting changes.

The joint effort between patients and physicians communicates co-production, which is an essential element of service operation management in healthcare service that makes the provision of care more consistent with the patient health-related needs (PALUMBO, 2016). In co-production, customers assume the primary role in service production and delivery and service providers facilitate and support customers’ activities by providing necessary platforms (DONG et al., 2015).

Vargo and Lusch (2004) provided a conceptual underpinning of co-production. For them, value, for which customers seek services, is created during the interactive process and at the interaction between service providers and customers (VARGO, LUSCH, 2004). This value creation suggests that customers’ contributions are essential in addition to resources provided by service providers. Polypharmacy will be better managed if co-production becomes the primary model of care processes for the patients. Co-production mobilizes customers and ensures that customers provide tangible resources and codified and tacit knowledge and service providers receive desired inputs to deliver the required output (FREI, 2008). Moreover, patients in polypharmacy may not be alike in terms of their medical conditions and medical therapies and their care should be individualized; physicians need to understand patients’ context and prescribe care that best suits patients’ living. Co-production activities ensure that customers establish close contact with service providers and service providers have opportunities to customize services (CHAN et al., 2010).

Co-production activities may also result in increased efficiency in healthcare services offered for patients in polypharmacy. The patients and the health care professionals could share mutual information that would make physicians more efficient accruing the diagnosis, and define a joint strategy to deal with the patient illness (PALUMBO, 2016). Moreover, physicians can share the decision making process with patients to ensure that decisions are focused on the patient’s personal circumstances and values (BRADLEY, 2015), which make the patients more comfortable with the decisions made about their care (COULTER, 2010). Furthermore, physicians can use patients’ inputs to develop new therapies (von Hippel; Magnusson; Wikstrom as cited in MUSTAK et al., 2013) or enhance outcomes and experience for both carers and service users (BRADLEY, 2015). Additionally, physicians may experience relational value in friendly, respectful, and attentive communication with patients, that, in turn, may help physicians to perceive more satisfaction in their jobs (YOON et al., 2004). However, co-production initiatives in managing polypharmacy can be a double-edged sword; it can benefit patients and physicians, but it can also yield negative consequences such as increasing physicians' job stress and reducing their job satisfaction (CHAN et al., 2010).

Co-production is a social exchange, which accommodates people’ norms, roles, and expectations, which, in turn, are influenced by each party’s cultural background (PATTERSON, COWLEY, PRASONGSUKARN, 2006). Therefore, the benefits of co-production depend on how well patients and physicians adapt to the newly defined social behaviors (YOUNGDAHL et al., 2003). Malhotra et al. (1994) have found that high collectivist value-oriented people tend to be more expressively motivated in establishing social relationships. Co-production will likely flourish among those people because they will
adapt their behaviors in roles that facilitate cooperation and personal connections (STRYKER, STATHAM, 2005). On the other hand, high individualist value-oriented people prefer rewards that are proportional to their contributions. They are more likely to involve in a business relationship and are less concerned about building a personal relationship (CHAN et al., 2010) and thus, are inappropriate candidates for co-producing initiatives.

Co-production might heighten physicians’ job stress and lower their job satisfaction, increasing the loss of power and control, input uncertainty, and incompatibility in expectations and demands (CHAN et al., 2010). Co-production allows the patient to gain control of their wellbeing (AUJOULAT, YOUNG, SALMON 2012), thus power is to be given by health providers to patients and taken from providers by patients (MCALLISTER et al., 2012). The loss in power and control may trigger a role incongruence, in which physicians perceive disruption in the smooth functioning of the service process and this perceived disruption might induce them to struggle with patients for control (CHASE, 2010). As the degree and quality of patients inputs can vary considerably (MUSTAK et al., 2013), physicians may perceive greater demand diversity, which will trigger uncertainty (DURDEN et al., 2013). This added uncertainty might ultimately hamper their job satisfaction and increase their job stress (CHAN et al., 2010).

Therefore, every simulation of co-producing initiatives may not benefit patients and physicians. Additionally, it can overwhelm service scripts and jeopardize treatment process. It is utmost important that physicians understand how to harness the benefits and limit the drawbacks (CHAN et al., 2010). They may need to adopt some practical actions. They should remain sensitive to their and patients’ cultural value (CHAN et al., 2010). In some cases, they may need to introduce cultural changes in their operations (CHAN et al., 2010), introduce appropriate training and reward system to equip and motivate staffs (MUSTAK et al., 2013), select those staffs who are flexible, responsive and facilitate personal relationships (CHAN et al., 2010). They may also diversify special cases (CHAN et al., 2010) and motivate (CHAN et al., 2010) and train patients to embrace co-production and develop abilities to follow prescribed behaviors (CHAN et al., 2010). Motivation and training are particularly important for care processes that are more complex and contain situations that are less familiar to patients (CHAN et al., 2010).

3. METODOLOGY

This research used a phenomenological approach. Capturing and describing sensory perceptions are the focus of phenomenological research (PATTON, 2002). Phenomenological research aims to “capture and describe how people experience some phenomenon-how they perceive it, make sense of it, judge it, remember it, and talk about it with others” (PATTON, 2002, p. 104).

The unit of analysis of the research was patients and physicians. Four patients and three physicians were interviewed. The patients take at least 5 medicines in a day, live in Brazil, and are suffering from multiple chronic diseases. The reported medical conditions are high blood pressure, heart problem, asthma, depression, and breast cancer. The physicians work for Prevent Senior. The organization is in Sao Paulo, a state of Brazil, and accommodates elderly patients. Most of the patients at Prevent Senior are in polypharmacy. Therefore, the physicians have extensive experiences in dealing with polypharmacy.

Only qualitative data were collected. Separate questionnaires were used for the patients and the physicians. Questions to the patients were grouped under feeling, behavioral, knowledge, and opinion. The aim was to understand how patients experience polypharmacy and how their behaviors influence problematic phenomena in polypharmacy and to include the patients’ concerns in designing interventions. Questions to the physicians were to understand what causes polypharmacy and what interventions are in practice or should be designed in managing polypharmacy.
The data were collected conducting in-depth naturalistic interviews with a structured open-ended questionnaire. The interviews lasted twenty to fifty minutes. Most of the interviews were recorded using an electronic recorder. A few interviews needed manual recording using a paper and pen. The electronic recordings were transcribed for analysis.

An analytical framework approach was followed to analyze the data. The consequences, causes, and interventions of polypharmacy known through the literature laid the foundation of this analytical framework. This research sought a comparative approach, in which the findings of this research have been compared to the findings in the literature. The research intended to communicate the output of the comparison in three different components:

- What are the findings that conform to the literature?
- What are findings that oppose the literature?
- What are findings that were hidden and that were not communicated in the literature?

The structured open-ended questionnaires helped in organizing the data. The responses of the interviewees were grouped following the questions in the interview protocol. The grouped responses were codified using self-generated codes. The codes were cross-matched. Consequently, some commonalities and variations were found. The commonalities were used to generate themes. The variations were reported as special cases.

Approval has been obtained by Brazilian Ethical Committee in Health Research before conducting the interview. No interviewee was identified by his or her name, gender, profession, employability and social status. If a specific interviewee needed to be quoted, he or she was quoted pseudonymously.

4. FINDINGS

4.1. Interviewees’ Profiles

The patients interviewed live in Brazil and are suffering from multiple chronic diseases. The reported medical conditions are high blood pressure, heart problem, asthma, depression, and breast cancer. Most of the patients are in multimorbidity. Their medication intake ranges from fourteen to five. Useful information about the respondents has been detailed in Table 1.

<table>
<thead>
<tr>
<th>Respondents (pseudomonas name)</th>
<th>Category</th>
<th>Gender</th>
<th>Age</th>
<th>Medication Intake per day</th>
<th>Medical Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA1</td>
<td>Patients</td>
<td>Female</td>
<td>76</td>
<td>14</td>
<td>Blood pressure; Heart disease; Asthma</td>
</tr>
<tr>
<td>PA2</td>
<td>Patients</td>
<td>Female</td>
<td>55</td>
<td>6</td>
<td>Breast cancer</td>
</tr>
<tr>
<td>PA3</td>
<td>Patients</td>
<td>Female</td>
<td>28</td>
<td>5</td>
<td>Depression; Mineral deficiency</td>
</tr>
<tr>
<td>PA4</td>
<td>Patients</td>
<td>Male</td>
<td>64</td>
<td>10</td>
<td>Blood pressure; Heart disease</td>
</tr>
<tr>
<td>PH1</td>
<td>Physicians</td>
<td>Male</td>
<td>Not Known</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>PH2</td>
<td>Physicians</td>
<td>Male</td>
<td>Not Known</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Source: Elaborated by Author

The subsequent discussion has been organized into three sections, which answered the questions that this research sought to respond.
4.2. How Do Patients Experience Consequences of Polypharmacy - how do they perceive, describe, feel, judge, remember, understand, and talk about it with others?

This research found that polypharmacy triggered several consequences. Polypharmacy may induce non-compliance to medication guidelines. Excessive numbers may cause the patients to forget doses and name of medicines. Additionally, they are unlikely to get someone to manage their medication intake. Thus, the patients’ forgetfulness emerges and triggers the non-compliance. Polypharmacy may induce patients’ atypical behaviors. The patients may be annoyed by excessive numbers and skip doses. Moreover, they may feel accomplished and take a break by non-complying. Furthermore, they may be overwhelmed by excessive numbers and remember doses by color, but segmentation by color is faulty since colors do not represent medicines.

The non-compliance causes poor medication adherence. One of the fatal consequences of poor adherence is that the diseases progress. Moreover, the uncured diseases may trigger other biological dysfunctions, triggering abnormal activity in body functions. Sometimes, the patients cannot experience the effects immediately but suffer afterward. The dysfunctions are the typical case for some medicines.

Polypharmacy may be problematic for emergency cases. PS1 recalled a situation when she needed emergency treatment and was treated by the doctors who do not know about her medication intake. They provided treatments that worsen her emergency case. Later her regular doctors explained to her that the emergency treatments counter interacted with the medications taken already and produced side effects, which worsen her emergency case. The excessive number mingled with the special circumstance prevent and she could not communicate the medication intake.

Polypharmacy may deteriorate patients’ quality of life. Fear of side effects is common among those patients. The fear origin from the realization that too many medications are not good for bodies. Although medications provide benefits, they can be harmful to bodies. Excessive numbers cause the patients to take precautionary measures. Sometimes they forget to take the medicines. The patients are unhappy since they are forced to accept their life with multiple medications.

4.3. What Are the Causes of Polypharmacy?

This research found that several non-clinical factors induced polypharmacy. Visiting multiple providers is common to cause polypharmacy. When patients visit multiple physicians, the physicians do not cooperate to optimize the patients’ medication intake. Each provider specializes treatments, focusing on his or her field of expertise, which may generate redundancy in the patients’ medication intake. The patients who lack explanations remain unaware of the duplication. Consequently, they take more medicines than is necessary. The redundancy may also cause the patients to lose confidence in the physicians. The physicians might find that redundant medicines have been prescribed and try to correct the mistake. This corrective behavior may represent the physicians’ lack of expertise, which contributes to the patients’ lack of confidence. The lack of confidence might induce the patients to resist other cases in which the physicians try to reduce doses or ask to discontinue medications.

Some forms of lifestyle are common to induce polypharmacy. Smoking, poor diet, and a lack of exercise are prominent. These conditions expose individuals to multiple diseases. Some culture may influence in adopting these lifestyles. Country perspectives may influence as well. The government may lack the initiatives that motivate people to follow a healthy lifestyle. A person’s family background may contribute to adopting these lifestyles.

Accumulated multiple chronic conditions may trigger other medical conditions. Therefore, collateral medical effects, in which one dysfunction caused by a medical condition weakens other physiological functions and triggers other medical conditions, are common
among those individuals. The patients need multiple medications to treat individual cases and the cases caused by collateral effects.

Self-medication may induce polypharmacy. This research found some forms of self-medication such as discontinuing prescriptions, continuing expired prescriptions, skipping doses, and overdosing. One of the causes of self-medication is recommendations from persons other than physicians. Patients received medications not only from their physicians but also from their well-wishers such as friends, relatives or neighbors. This research found that sometimes patients also recommend their neighbors on medications. This mutual relationship intensifies cases of self-medication. This research found another factor, hypochondriacs, that may induce self-medication.

4.4. What Are the Appropriate Initiatives to Manage Polypharmacy?

This research perceived that several initiatives can be taken to minimize cases of polypharmacy and problematic phenomena in polypharmacy. Self-medication is caused by recommendations and hypochondriacs that receive medications from their well-wishers and also recommend medications to their neighbors. This research suggests that patients’ consciousness and knowledge can equip patients to refrain from acting on those recommendations or advise others in taking medication. Physicians should educate patients regarding the ill effects of self-medication and make them aware that people who advise in taking medication without prescription do not have sufficient knowledge and expertise.

A hypochondriac is a condition in which patients are abnormally anxious about their health. They feel insecure in prolonged gaps. Moreover, they doubt the efficacy of medications. This research suggests that if patients trust their doctors’ opinions, they will likely avoid those obsessive behaviors. Patients should be trained to trust their doctors. They should be advised to consult their doctors if they feel that they are experiencing hypochondriacs.

Poor diet, smoking, and a lack of exercise are likely to induce multiple chronic diseases. This research also suggests that physicians provide recommendations specific to those aspects and encourage patients to adopt a healthy lifestyle and that physicians design their care in a way that communicates a cooperative approach, in which patients assume some responsibilities in care processes. It is the patients who determine whether a particular treatment is going to be beneficiary or problematic. Physicians can not force patients to be proactive. It is also difficult to follow up with every patient.

Multiple providers are likely to induce polypharmacy. They are unlikely to cooperate in optimizing patients’ medication intake. Moreover, each provider specializes treatments, focusing on his or her field of expertise. This behavior increases the number of medications and the possibility of redundant medications. This research suggests that there should be a coordinator when patients visit multiple providers. The coordinator will look after patients’ medications intake. The coordinator can be any physicians who are aware of the patients' medical history.

Patients may experience recurring costs, unhappiness, and unpleasant feelings, while they are in polypharmacy. This research found that those adverse experiences are a result of excessive pills. This research suggests that the patients should be offered combined pills, in which several substances are combined in a pill or several pills are merged and put in an ingesting form. This initiative might reduce the number of pills and the corresponding adverse consequences. Fear of side effects, which contributes to poor quality of life, is a typical case of a lack of consciousness and knowledge. This research suggests that physicians educate patients about medication intake. The patients should know how multiple medication intake might affect them and what they should do in different circumstances.

Polypharmacy can induce patients’ forgetfulness and atypical behaviors. Consequently, the patients may not comply with the medication guidelines. This non-
compliance may trigger poor medication adherence. This research suggests that physicians understand how the patients adopt treatments and individualize the treatments that minimize the adverse circumstances. This research also found that the number of pills can trigger patients' forgetfulness. Combined pills will also be useful to minimize the patients’ atypical behaviors. PH1 communicated that the patients may be annoyed by the excessive number or felt accomplished and skip doses or remember doses by color and trigger faulty compliance. A lack of motivation and knowledge are likely to cause these atypical behaviors. Physicians should individualize treatments to prevent circumstances that induce the patients toward those atypical behaviors.

5. DISCUSSION

This discussion has been organized into two sections, which presented the output of the comparative approach sought to analysis the data.

5.1 What Conforms Literature. What Was Hidden and Has Been Not Communicated in Literature?

5.1.1 The Consequences of Polypharmacy

Polypharmacy induces non-compliance to medication guidelines (Goulding, 2004; Frei et al., 2001). However, the literature did not discuss how polypharmacy induces patients’ non-compliance. This research found that excessive numbers may cause the patients to forget doses. Additionally, they are unlikely to get someone to manage their medication intake. Thus, the patients’ forgetfulness triggers the non-compliance. Polypharmacy may also induce patients' atypical behaviors. The patients may be annoyed by excessive numbers and skip doses. Moreover, they may feel accomplished and take a break by non-complying. Furthermore, they may be overwhelmed by excessive numbers and remember doses by color; but segmentation by color is faulty since colors do not represent medicines.

The non-compliance may cause poor medication adherence. Goulding (2004) and Frei et al. (2001) also confirmed this finding. This research found that when the patients experience poor medication adherence, the diseases progress and the patients remain ill. The uncured diseases may trigger other biological dysfunctions.

Montiel-Luque et al. (2017) and Riker and Setter (2012) argued that patients in polypharmacy experience poor quality of life including physical and social function. Bradley et al. (2012) and Pappa et al. (2011) argued that increased pharmaceutical expenditures result in poor quality of life. This research also found that the recurring costs bother the patients; the medicines are expensive and have to be taken on a continuous basis.

This research uncovered some more aspects that may also deteriorate the patients’ quality of life. Fear of side effects was common among the respondents (patients). The fear originated from the realization that too many medications are not good for bodies. Moreover, polypharmacy may cause unhappiness. The patients communicate unhappiness emerged from the obligation to accept their life with multiple medications. Furthermore, there is an unpleasant feeling associated with multiple medicines.

5.1.2 The Causes of Polypharmacy

Several factors induce polypharmacy. Visiting multiple providers is common to cause polypharmacy. Anthierens et al. (2010) also confirm this finding. This research found that specialization may generate redundancy in the patients’ medication intake. The patients who lack explanations remain unaware of the duplication. Consequently, they take more medicines than is necessary. Different hours of doses might strengthen the redundancy. The physicians may set a different time for doses. Now, the same medicines are disguised in different hours. Because of this incognito, the patients will likely believe that the medicines are different. The physicians might find that redundant medicines have been prescribed and try to correct the mistake. This corrective behavior may represent the physicians' lack of expertise, which contributes to the patients’ lack of confidence. The lack of confidence might induce the
patients to resist other cases in which the physicians try to reduce doses or ask to discontinue medications.

Some forms of lifestyle are common to induce polypharmacy. Smoking, poor diet, and a lack of exercise are prominent. Similar accounts have been found in the literature. Pappa et al. (2011) reasoned that smokers are more likely to suffer from multiple diseases that necessitate multiple medications. This research found that smoking is likely to degrade the lung and causes anxiety. These conditions expose the persons to multiple diseases. Pappa et al. (2011) also associated polypharmacy with obesity, which is a common consequence of poor diet and the lack of exercise. They have reasoned that obesity deteriorates patients’ quality of life and trigger many chronic diseases that necessitate multiple medications (PAPPA et al., 2011). This is finding is also apparent in this research.

This research revealed that some factors may induce smoking, poor diet, and the lack of exercise. Some culture may influence in adopting these lifestyles. The country perspectives may influence as well. The government may lack the initiatives that motivate people to follow a healthy lifestyle. A person’s family background may contribute to adopting these lifestyles.

This research also revealed that the accumulated multiple chronic conditions may trigger other medical conditions. Therefore, collateral medical effects, in which one dysfunction caused by a medical condition weakens other physiological functions and triggers other medical conditions, are common among those individuals. The patients need multiple medications to treat the individual cases and the cases caused by the collateral effects.

Anthierens et al. (2010) mentioned that self-medication may induce polypharmacy. This research identified some forms of self-medication such as discontinuing prescriptions, continuing expired prescriptions, skipping doses, and overdosing. One of the causes of self-medication is recommendations from persons other than the physician. Anthierens et al. (2010) also confirmed this finding. They mentioned that patients received medications not only from their physicians but also from their well-wishers. This research added that sometimes patients also recommend their neighbors on medications. This research found another factor, hypochondriacs, that may induce self-medication.

5.1.3 What Are the Appropriate Initiatives to Manage Polypharmacy?

Several initiatives, which were not discussed in the literature, may be taken to manage polypharmacy. Patients’ consciousness and knowledge should be helpful in preventing self-medication. Moreover, patients’ trust over their doctors’ will likely avoid circumstances that trigger hypochondriacs. Furthermore, specific recommendations regarding lifestyle may encourage patients to adopt a healthy lifestyle. Additionally, physicians should educate patients about medication intakes. Physicians should also individualize treatments, understanding how patients adopt treatments.

Combined pills will likely reduce excessive pills, which induce poor quality of life and medication adherence. Combined pills are not unrealistic. Some medicines have already been supplied, combined several substances. One challenge of combined pills is that pharmaceutical companies might resist extensive proliferation of combined pills because combined pills will likely reduce such companies’ turnovers. However, some factors might overshadow the resistance. Combined pills will position a company as a unique provider in the market. The company can even command a premium price. Those market advantages will likely compensate for the potential losses. Other than pharmaceuticals companies, manipulation pharmacies can also provide combined pills. However, such a case on a big scale is unlikely. The reasons are a lack of expertise, and legislation and enforcement. Appointing a coordinator, when patients visit multiple physicians, should be a useful approach. This finding is also reported by Anthierens et al. (2010) and Guthrie et al. (2015). They added the coordinator will look after patients’ all medication prescribed by different providers.
5.2. What Opposes Literature

This research found some aspect that contradicts the literature. Polypharmacy has been associated with several adverse consequences such as adverse drug events, drug-drug interactions (HERR et al., 2017) and poor medication adherence (KUIJPERS et al., 2007; COLLEY, LUCAS, 1993). The association between polypharmacy and those adverse consequences are not inherently linear. It is possible that some patients who experience or who are likely to experience polypharmacy may not suffer the adverse consequences of polypharmacy. The adverse effects of polypharmacy are context specific; the effects depend on the patient’s physiology, health status and medical condition(s).

A popular view is that polypharmacy is an elderly people phenomena (65+) (ANTHIERENS et al., 2010; HOVSTADIUS et al., 2010; PAPPA et al., 2011). However, this research found that some respondents who are below 65 experienced polypharmacy. Therefore, polypharmacy may not be elderly people phenomena. Another study supports this view. Guthrie et al. (2015) argued that multimorbidity is a significant predictor of polypharmacy and multimorbidity is also common among people who are less than 65 years.

6. CONCLUSION

This research aimed to illustrate how physicians can reduce cases of polypharmacy or help patients in dealing with the adverse effects of this condition by focusing on non-clinical perspectives of polypharmacy. In this context, this research answered three specific questions: how patients experience consequences of polypharmacy; what causes polypharmacy; and what interventions should be appropriate to manage polypharmacy.

This research suggests that increased patients’ consciousness and knowledge may minimize cases of recommendations and hypochondriacs and thereby self-medication, a cause of polypharmacy. Moreover, a cooperative approach and physicians’ recommendations can encourage the patients to adopt a healthier lifestyle by refraining from poor diet, smoking, and lack of exercise. Furthermore, the role of a coordinator, when multiple providers are involved, may optimize the patients’ medication intake and will less likely expose patients toward polypharmacy. The reduced cases of polypharmacy will invariably reduce the adverse effects such as adverse drug events, drug-drug interactions, poor medication adherence and thereby improve the patients’ outcomes.

The improved outcomes might result in an additional benefit. The adverse effects of polypharmacy may require additional treatments, which necessitate additional health services. If the adverse effects are less likely, the patients will be less likely to utilize additional health services. Consequently, the potential costs related to the utilization of health services can be saved. In this regard, this research should be relevant for some Governments who bear their citizens’ health care costs, and for insurance companies who are responsible for their clients’ health care costs. Both carriers can save some potential costs if their beneficiaries are in polypharmacy.. Therefore, every simulation of the initiatives on polypharmacy may not result in cost savings. Insurance companies and Governments should review their beneficiaries’ profiles and adopt initiatives for those who are likely to suffer the adverse consequences of polypharmacy. Otherwise, insurance companies might find their profit plummeted because the return of the initiatives did not cover the costs of the initiatives. Governments might spend its scarce resources in less productive ventures.

The research also suggests that combined pills can reduce excessive pills, which, triggering recurring costs, unhappiness, unpleasant feelings, and patients’ forgetfulness and atypical behaviors, turns polypharmacy into problematic phenomena. Furthermore, individualizing the treatments will reduce cases such as forgetfulness and atypical behaviors that induce poor medication adherence. Such instances to minimize problematic phenomena in polypharmacy will provide less burdensome life to the patients who are obliged to be in polypharmacy. In this regard, this research should be relevant for the care centers that are
dedicated to accommodating patients who experience or who are likely to experience polypharmacy and that strive to manage polypharmacy by minimizing the problematic phenomena that are likely to emerge in the future.

The finding of this research can also benefit pharmaceutical companies. Combined pills, which is one of the interventions proposed in this research, can broaden pharmaceutical companies’ product categories. Combined pills have already been explored; companies supply many medicines, combining several substances. However, the focus of combined pills is limited to provide clinical necessities. Prospects of combined pills as a market advantage have not been explored. The resulting need can position a pharmaceuticals company as a unique provider in the market. The uniqueness will likely increase the turnover and enable the company to command a premium price. Pharmaceutical companies can introduce combined pills as an additional product. This initiative will help companies in keeping the existing market and avoiding plummeted sales because of the substitution.

In the academic field, researchers who want to explore non-clinical perspectives of polypharmacy may find this research useful. The literature on non-clinical perspectives of polypharmacy was scattered enough to make a holistic picture possible. This research has compiled the relevant literature on consequences, causes, and interventions of polypharmacy. Using this foundation, the researchers can get a holistic picture of non-clinical perspectives of the care processes relevant to manage polypharmacy and design their future scholarly works on polypharmacy.

7. REFERÊNCIAS


