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# A Sociolinguistic Analysis of Code Switching in Medical Register

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Abstract --- The research work is associated with identifying an indepth understanding about the ways that are used by patients and practitioners to handle the medical registers of language in medical communication. The research works focuses on the codeswitching approaches in the medical communication that is important in patients. However, some challenges are associated with code switching usage in medical communication due to the usage of code switching along with its frequency as well as pattern of code switching. Previous researchers have focused on the impact of patient education level in code switching as well as the role of doctors to handle the approaches. The study is also supported by the concepts of theory of language acquisition device. However, previous research has not focused on the role of administration and leadership in that particular field. A descriptive research design is followed in order to collect primary data from the medical practitioners in order to generate further outcomes that can be valued in that particular research field. Software like IBM SPSS is used to generate results from the collected quantitative data. The result of quantitative data analysis shows that changes in the coding process in medical registers are taking place and explores that different coding for different medical procedures is observed. Hence, the outcome suggests that components like doctor and patient demographics and contextual circumstances. Moreover, a variety of factors impacts the usage of registers in medical communication. Further recommendations are generated in respect to the study outcome that shows that ways such as implementation of better technology is effective to initiate better code-switching programs. Moreover, government support and further training of medical staff can be effective to manage the code-switching approach in terms of handling the medical register.

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*Keywords*---code switching, Inter-sentential switching, lexical shifting, stimuli.

#### Introduction

#### Background

Code switching refers to the phenomenon of switching between different language registers or varieties within a single conversation or interaction. In the context of medical register, code switching refers to the use of different language varieties or registers by medical professionals and patients in medical communication (Alkhlaifat et al., 2020). This can include switching between medical and non-medical registers, or between formal and informal language. Medical communication is a complex and specialised form of communication that requires the use of specialised vocabulary and language structures (Nur'Aini and Fanani, 2019). The use of appropriate language registers in medical communication is crucial in ensuring that patients receive accurate and effective care. However, code switching in the medical register can also lead to misunderstandings and miscommunication, which can result in serious consequences for patients.

#### The problem Statement

The phenomenon of code switching in medical registers, and the influence of sociolinguistic factors on its use, is poorly understood, leading to potential misunderstandings and miscommunication in medical communication (Nur'Aini and Fanani, 2019). Code switching in the medical register can result in misunderstandings and miscommunication between medical professionals and patients, which can have serious consequences for patient outcomes (Alkhlaifat et al., 2020). For example, a patient may misunderstand important information about their medical condition or treatment due to a mismatch in language registers between the doctor and the patient.

#### Hypothesis

IV: Patient demographics, Doctor Demographics and Contextual factors

DV: The frequency and patterns of code switching

H1: Patients with higher levels of education will use more medical registers in their interactions with doctors compared to those with lower levels of education.

H2: Doctors who come from the same ethnic background as their patients will switch less to medical register compared to those who come from a different ethnic background.

H3: The frequency of code switching in the medical register will be higher in a new patient appointment compared to a follow-up appointment, as there is less prior familiarity between the patient and doctor.

#### Aims of the Study

The aim of the research is "to gain a deeper understanding of the ways in which medical professionals and patients use different registers of language in medical communication, and the factors that influence this use."

#### Questions of the Study

RQ1: What are the frequency and patterns of code switching between medical and non-medical registers in doctor-patient communication?

RQ2: What are the challenges that arise in medical communication due to the use of code switching?

#### Significance of the study

Conducting research on "a sociolinguistic analysis of code switching in medical register" is important for a number of reasons. Firstly, medical communication is a critical aspect of patient care, and the use of appropriate language registers is crucial in ensuring that patients receive accurate and effective care. According to Nur'Aini and Fanani, (2019), code switching in the medical register can lead to misunderstandings and miscommunication, which can result in serious consequences for patients. Through studying the frequency and patterns of code switching in medical registers, and the factors that influence it, we can gain a deeper understanding of how language use in medical communication affects patient outcomes.

Additionally, studying code switching in the medical register has implications for the field of sociolinguistics more broadly (Nur'Aini and Fanani, 2019). Medical communication is a complex and specialised form of communication and exploring the use of language in this context can provide new insights into the ways in which language use is shaped by social factors, such as demographics and context. This research can also contribute to our understanding of the role that language plays in shaping power dynamics between medical professionals and patients.

#### Literature review

#### Introduction

The literature review chapter will discuss the works of the previous scholars from different perspectives. The researcher will critically analyse the different aspects of this particular research field that was explored by other researchers. At the same time a relevant theory will be discussed in this particular chapter that will help the researcher in order to conduct the study in a systematic way. The researcher will analyse the research papers of other researchers on this particular topic and will identify a particular aspect that was ignored by them. Therefore, the literature gap will be identified in this particular chapter as well.

#### The impact of patient education level on code switching in medical register

Code switching is a linguistic phenomenon, where a speaker alternates between two or more languages or dialects in the same conversation. It is a common occurrence in many multilingual societies, such as Malaysia, where English is the official language, but Malay, Chinese, Tamil and other languages are also widely spoken (Nur'Aini and Fanani, 2019). The patient education level is an important factor in code switching in the medical register. The level of education of a patient can affect the way in which the doctor communicates with them. For example, if the patient has a higher education level, the doctor may be more likely to use medical jargon and complex language during their conversation. As stated Torab-Miandoab, (2023) if the patient has a lower education level, the doctor may switch to a language or dialect that the patient is more likely to understand.



Figure 1: The impact of patient education level on code switching in medical register (Source: owlcation.com, 2022)

In Malaysia, the patient education level is an important factor in code switching in the medical register. This is because the country has a diverse population with different levels of education. For example, in a typical Malaysian hospital, the doctor may communicate with a Malay patient in Malay, while they may communicate with a Chinese patient in English or Chinese (Nur'Aini and Fanani, 2019). In addition, the doctor may use a combination of English and Malay, depending on the patient's level of understanding. In general, the patient education level has a major impact on code switching in the medical register in Malaysia. Doctors need to be aware of the patient's level of education and adjust their language accordingly. According to Torab-Miandoab, (2023), this will ensure that the patient can understand the information the doctor is giving them and that the doctor is speaking in a language the patient is comfortable with (Kannampallil and Adler-Milstein, 2023). This can help the doctor to build a stronger relationship with the patient and ensure that they get the best possible treatment. This can help the doctor to provide the patient with the best possible care. Doctors need to be aware of the patient's level of education and adjust their language accordingly (Winkelman et al., 2022). In order to provide the correct services to the patients it is of immense importance to understand the problems and requisites of a patient and benefits the doctors in providing appropriate services.

#### The role of doctor and patient ethnicity in code-switching

Code switching is the process of mixing the syntax, codes and languages in a single conversation. It has clear implementation into the medical industry. However, most of the staff are unaware about the code switching. It is used by doctors to communicate with their patients in an ethical and most effective way. It is a communication process for the interaction between the doctor and the patient (Alhamami, 2020). Tape recording and questionnaire is used to understand the behaviour of the patients and it is studied in a coded system to maintain the confidentiality of the curtain information of the patient. It is a kind of pathological response to the stimuli of systemic racism. It is highly used in the regional spaces to communicate effectively with patients and to maintain the communication comfortability of the patients (Nur'Aini and Fanani, 2019). Code switching is an extremely powerful psychological tool used on patients for accepting the content. It is also used to deal with racist behaviours to deal with any kind of misbehaviour from the side of hospital staff towards the patients. As the world has become multilingual with globalisation, it is highly important to implement a coded system to communicate well. People use their dialect and language as per the feasibility of the communication.

However, doctors have the opportunity to use code switching to avoid any kind of language barriers. Code switching can be done from one format to another in several ways. It can be formal to informal, humorous to serious, personal to official, solidarity to politeness. Fu (2019), states that, code switching can help in asserting power, declaration of solidarity, and maintenance of neutrality. Irrespective of dissimilar background, doctors and patients can cooperate with one another and can recognise the one another easily. A rapid code switching is also known as code mixing (Kannampallil and Adler-Milstein, 2023). In this kind of communication generally two kinds of codes are mixed. It is a process of creating a multi-language communication process.

The identity of minorities can be concealed to remove any kind of disrespect or biased treatment. Code switching is of different types and can be done in several ways between patients and the doctors (Kannampallil and Adler-Milstein, 2023). Categories include tag switching, Inter-tential switching, Intra-tential switching (McCluney et al., 2021). In tag switching between the doctor and the patient, any tag of any language is inserted into another. Inter-sentential switching creates a clause or boundary in one language.

#### The effect of contextual factors on code-switching in medical register

In the medical register, code-switching can have a significant impact on patient care and effective communication between healthcare providers and patients (Kusi-Appiah, 2022). In order to understand the effect of contextual factors on code-switching in the medical register, it is important to consider the social, cultural, and linguistic aspects of the situation.



According to Vitale et al. (2020), one of the most important contextual factors that affect code-switching in the medical register is the social power dynamics between the healthcare provider and the patient. In case the healthcare provider is perceived to have higher social status or power, they may switch to a language that the patient is less familiar with, leading to a breakdown in communication and a decrease in patient satisfaction (Norouzinia et al., 2018). On the other hand, if the patient is perceived to have higher social status, they may switch to a language that they are more comfortable with, even if it is not the language typically used in the medical register (García-Izquierdo and Montalt, 2022). The social power relations between the healthcare professional and the patient are among the most significant contextual factors that influence code-switching in the medical record. Finally, linguistic factors can also play a role in code-switching in the medical register (Hamed, 2020). The complexity and specialised vocabulary used in medical language can make it difficult for patients to understand what is being discussed. According to Wood (2019), in these cases, healthcare providers may switch to a language that is more accessible and understandable for the patient, even if it is not the language typically used in the medical register.

In conclusion, the effect of contextual factors on code-switching in the medical register can impact on patient care and communication between the patients and the medical staff. Understanding the social, cultural, and linguistic aspects of code-switching can help healthcare providers to make informed decisions about the language they use, and to ensure that they are providing the best possible care to their patients.

# The impact of code switching in medical register in order to enhance the efficiency of medical professionals

Medical professionals use different kinds of codes in order to refer to equipment, medicines or diseases. This kind of language was created to make the communication more efficient and seamless. Many healthcare related equipment or medicines have long complicated names. Therefore, it is really difficult to pronounce those names and it makes the communication really difficult between medical professionals (Puspita et al., 2022). Therefore, the idea was to create an efficient code language for the medical professionals to improve the communication process. For example, a commonly known code is BP which is used for blood pressure. As per Grata-Borkowska et al. (2022), doctors, other medical professionals and patients use this code frequently to communicate with each other. Now pronouncing blood pressure might be difficult for some patients who do not have the proper education. However, pronouncing BP is easy for everyone and the message can be conveyed in an easy manner.



Figure 3: The impact of code switching in medical registered (Source: Created by the learner)

In the operation theatres doctors, nurses and other medical professionals are not allowed to talk because this can be dangerous for the patient. Therefore, they use code languages and gestures to describe different equipment and medicines (Al-Ahdal, 2020). This kind of code language creates better communication between doctors and other medical professionals and they can coordinate with each other in an efficient manner.

Theoretical Underpinnings Language acquisition device theory

This particular theory was invented by Noam Chomsky in 1960. The theory says that little children have a natural capacity to learn language. The theory advocates that humans are born with the instinct of learning language by observing and hearing (Alkhlaifat et al., 2020). The theory says that the children are naturally inquisitive and curious about the surrounding environment. This quality of human beings helps them to understand and learn different languages.

Therefore, Mr. Chomsky recommends in his theory that it is useless to make the children learn about the grammar of different languages.



(Source: gutyerlle.wixsite.com, 2023)

The theory advocates that children can learn the meaning of a particular word or a sentence by observing the body language of the speaker. Hand gestures and body movements play a great role in order to educate the students about different languages. This is because it provides a practical experience of conveying a particular message to another individual (Kannampallil and Adler-Milstein, 2023). This kind of process is more engaging and understandable, especially for the young children. According to this linguistic theory grammar makes it complicated for the students to grasp the basic concepts of language. Language was originally designed for practical purposes; therefore, it is really difficult to theoretically codify all the rules of a language (Rahman and Rahman, 2021). Another reason is languages are constantly evolving; therefore, it is really difficult to create new grammatical rules in order to codify a particular language. Hence, these are some language acquisitions that has been affecting the sociolinguistic analysis of code switching in medical register.

The medical professionals use different codes to refer to different equipment, medicines and diseases. It makes it easier for the medical professionals to describe different equipment and diseases as well. However, these names are not used in the medical course but the professionals use this for their own convenience. Therefore, these short forms or codes do not abide by the rules or the structure of grammar. It can be understood that the language acquisition device theory has been used to create these codes. On the other hand, the medical professionals do not need formal training to understand these codes. It is the natural Instinct of human beings that helps them to understand these codes.

#### Literature Gap

The research scholars have explored different aspects of this research field from different perspectives. They have explored topics like the impact of code switching or the effect of contextual factors of code switching and more. However, the role of administration of the healthcare institutes and also the impact of the decisions taken by the leadership on code switching has been completely ignored. The research scholars can explore this particular topic in future. This is because the leadership of any institution has a profound impact on every aspect.

#### Summary

Researcher has gained sufficient knowledge from this chapter by analysing different research papers of other researchers on this particular topic. The different studies of other researchers on this particular field has been analysed in this particular chapter. At the same time a particular aspect has been identified that had been ignored by other scholars. Therefore, this chapter has provided significant knowledge to the researcher in order to conduct the study in a systematic manner.

#### Methodology

#### Introduction

Research methods are considered as a systematic method in order to resolve the research problem. Before finding out the best result the researcher will implement various techniques such as data collection, analysis, research approach, philosophy, sampling, instruments and provide a detailed interpretation of data.

#### Research Philosophy

The main purpose of research philosophy is to deal with the nature, source and development of knowledge. Based on this research method, the researcher has also get a chance in order to analyse all of their data through their own beliefs and procedure. Some kinds of research philosophy are positivism, pragmatism, interpretivism. Here, for this study the researcher has been utilising positivism research philosophy (Tamminen and Poucher, 2020). Based on this selected research philosophy, the researcher can understand the importance of medical linguistics to society and then select a code for the improvement of healthcare services.

#### Research Approach

Research approach is a kind process which helps the researcher to gather, analyse, and interpret all of the information. There are two kinds of research approaches, deductive and inductive. Among all of these, the researcher has selected a deductive research approach for this study (Casula et al., 2021). Here, through the help of deductive research approach, the researcher becomes capable to test their hypothesis and confirm about the existing or implemented theories. The researcher also finds out many variables such as demographic information of the selected sample or population. All of these factors are hypotheses tested by the researcher by help of this deductive approach.

#### Research Design

Research design is often considered a blueprint of a scientific study. According to the researcher, there are some divisions in research design like descriptive, quasiexperimental, experimental and exploratory. The quasi- experimental and experimental both of these help to identify the validity, ethics, components from the present study. The researcher applied descriptive research design (Sileyew,

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2019). Consequently, through the help of descriptive research design the researcher becomes able to describe the impact of independent variables on dependent variables, which is the frequency and patterns of code switching. On the other hand, each of the research themes, which are made by the researcher by hypothesis has been elaborately designed and described by the selected research design.

#### Data Collection

There are two kinds of data collection methods: primary and secondary (Mishra and Alok, 2022). Primary data collection method refers to the method, which helps the researcher to collect information from real sources through interviews, surveys, questionnaires. On the contrary, the secondary data collection method guides the researcher to collect information through authentic websites, articles, and journals and so on.

Here, the researcher has applied a primary data collection method and collected data from the medical practitioners by using questionnaires. Therefore, in this questionnaire, the researcher also includes some questions regarding the medical linguistics code and its importance (Heap and Waters, 2019). Furthermore, the researcher also decided to collect information from 50 medical practitioners across all Malaysian healthcare services. Apart from this, by selecting the primary data collection method, the researcher also becomes capable of gathering information from real sources, so the authenticity and significance of the data increases at the same time.

#### Data Analysis

After collecting all of the data for the present research study, the researcher focused on the data analysis process. Data analysis is a kind of procedure for cleaning, transforming, inspecting and modelling information. The two kinds of data analysis methods are quantitative and qualitative (Mishra and Alok, 2022). Both of these have different purposes and significance for the research study. Quantitative data analysis method is a set of statistical techniques, whereas, the qualitative data analysis method indicates the interpretation of data in logical ways.

The researcher has applied a quantitative data analysis method for this study. The quantitative data analysis method allows the researcher to analyse all the information in a mathematical way (Bloomfield and Fisher, 2019). For example, the number of medical practitioners who support the medical linguistic code, and their age, gender, and income level- all of these are determined by the researcher through the help of quantitative data analysis methods. Generally, the number of irrelevant data was decreased for the use of quantitative data analysis method.

#### Sampling Size

Sampling size is a very effective research method for the researcher to observe the selected number (Berndt, 2020). The researcher conducted the final survey among 50 medical practitioners. Additionally, the researcher selected a random

stratified sampling method because it helps the researcher to collect information regarding medical linguistic code so the variety of data also increased at the same time.

#### Instruments

After the selection of a specific population to collect data, it is equally necessary to interpret all of the data. The tools of the instrument mainly help the researcher to monitor over the management of study, measure, fabricate or manipulate any kind of resources. Here, for this present study as an, instrument the researcher has decided to utilise IBM SPSS software (Wagner, 2019). Applying this software as an instrument, the researcher becomes enabled to measure the value of their study. After providing answers through questionnaires the researcher can identify any kind of duplicate data or irrelevant data by this SPSS software. Therefore, this instrument becomes very effective and beneficial for the researcher.

#### Ethical Consideration

The concept of ethical considerations is a set of principles, which include potential harms, violence. Based on the ethical considerations, the researcher always focuses on some particular act or regulations, which help the researcher to conduct their study in a legal way. The researcher has decided to implement the **"Data Protection Act, 2018"**, in Malaysia for this study (Sileyew, 2019). This act has helped the researcher to collect information from the medical practitioners in the right way. During the same period, the researcher will also ensure their participants that all of the provided data are safe and secure and without their permission all of these will not be shared by anyone.

#### Summary

The research methodology chapter has critically analysed the different kinds of research methods like data collection, analysis, research design and many more. During the same period, from this chapter it is also identified that the researcher utilised primary data collection method to collect data. Additionally, in order to analyse information, the researcher applied a quantitative data analysis method.

#### Findings

#### Introduction

The introduction of the result chapter is included in a dissertation in order to provide the correct information about the analysed data regarding the topic under consideration. However, in this dissertation, the reliability testing, the common method variance testing, the regression process, the hypothesis testing, the descriptive analysis, demographic information will be focused by the researcher. Along with that, the researcher in this section has also discussed multicollinearity analysis, normality, Non-responsive Bias and Homoscedasticity and so on. All these things will be effective and significant enough for the better understanding of the results or the final outcome of the research. In order to do so, the researcher will also provide the statistical data and tables related to the analysis of the collected data.

Quantitative Data Analysis Demographic Information

		Count	Column N %
		Count	Column N 76
Age	25 to 30 years	5	10.0%
	31 to 35 years	26	52.0%
	36 to 40 years	7	14.0%
	41 years and above	12	24.0%
gender	Male	34	68.0%
-	Female	14	28.0%
	Not interested	2	4.0%
experience	2 to 5 years	22	44.0%
-	6 to 10 years	14	28.0%
	11 to 14 years	3	6.0%
	More than 14 years	11	22.0%
10 0 11			

#### Table 1: Demographic Information

(Source: Created by Learners)

#### Common Method Variance Testing

The common method variance testing is nothing but a way through which the researcher tries to create a relationship based on the dependent and the independent variables of the research. On the other hand, it can be said that the common method variance is helpful to identify the variables also in a research process in which the researcher becomes able to create the different themes required for the study under consideration (Rodríguez-Ardura and Meseguer-Artola, 2020). However, these themes based on the dependent and the independent variables are also helpful for elaborately discussing the different topics or aspects associated with the research study.

On the other hand, it can be said that the entire process of selecting the dependent and then independent variables through the use of the common method variance is based on the common method biases that are helpful for the proper application of this process. However, some researchers are of the opinion that the process of common method variance is designed based on the spurious relationship between the variables.

			Total Va	riance Explain	ce Explained				
Componer	nt	Initial Eige	envalues <sup>a</sup>		Extraction Sums of Squared Loadings				
		Total	% of	% of Cumulative		% of	Cumulative		
			Variance	%		Variance	%		
Raw	1	1.444	23.559	23.559	1.444	23.559	23.559		
	2	.981	16.003	39.562					
	3	.729	11.902	51.465					
	4	.605	9.868	61.333					
	5	.472	7.702	69.035					
	6	.412	6.716	75.751					
	7	.325	5.306	81.057					
	8	.272	4.445	85.502					
	9	.226	3.695	89.197					
	10	.189	3.085	92.282					
	11	.148	2.408	94.690					
	12	.120	1.960	96.651					
	13	.089	1.457	98.107					
	14	.070	1.134	99.242					
	15	.046	.758	100.000					
	16	6.939E-	1.132E-	100.000					
		18	16						
Rescaled	1	1.444	23.559	23.559	1.757	10.980	10.980		
	2	.981	16.003	39.562					
	3	.729	11.902	51.465					
	4	.605	9.868	61.333					
	5	.472	7.702	69.035					
	6	.412	6.716	75.751					
	7	.325	5.306	81.057					
	8	.272	4.445	85.502					
	9	.226	3.695	89.197					
	10	.189	3.085	92.282					
	11	.148	2.408	94.690					
	12	.120	1.960	96.651					
	13	.089	1.457	98.107					
	14	.070	1.134	99.242					
	15	.046	.758	100.000					
	16	6.939E-	1.132E-	100.000					
		18	16						

#### Table 2: Common Method Variance

Extraction Method: Principal Component Analysis.

a. When analysing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

(Source: Created by the learners)

#### Reliability Testing

The reliability and the validity testing is the most common and important aspects in a dissertation. These two processes have also been used by the researcher in

analysing the collected data and information in this research study. It can be said that it is the basic or the fundamental responsibility of the research to maintain the reliability and the validity of the collected data and information for developing a research study (Sürücü and MASLAKÇI, 2020). The development and maintenance of the reliability testing processes and metrics are designed by the researcher in order to create the trust of the loyalty of the editors towards particular study on a specific subject matter.

However, it can be said that the maintenance of the reliability testing metrics in a research process is also helpful for standardising the entire study of the research. In comparison to the other research works conducted by the previous researchers it can be said that all the researchers try to maintain the authentic data and information for research to analyse the result of the final outcome. The application of this process is also helpful and significant for the better understanding of the leaders about the subject matter under discussion.

Item Statistics			
	Mean	Std.	Ν
		Deviation	
Most of the patients are not comfortable	4.1800	.69076	50
It is Necessary To Change Code	4.5000	.73540	50
It is Challenging To Maintain A Single Coding	4.4800	.50467	50
The education level of most of the patients is low	4.3000	.46291	50
Code for medical register complex	4.2000	.40406	50
Doctor Demographic Can Help The Improvement	4.3000	.46291	50
Behind The Bolster Of Cultural Competency Doctor	4.3800	.49031	50
Doctor demographic also creates a healthy	4.5000	.50508	50
The Rate Of Doctor Demographic Influenced The Service	4.3000	.46291	50
The Characteristics Of Doctor Demographics	4.2600	1.08440	50
Coding Of Medical Register Changes	4.1200	.91785	50
Patient understand the coding of the medical register	4.2000	.57143	50
Different Coding For Different Medical Procedure	4.2400	.47638	50
Appointment Of Thedoctorscanchangethe Coding	4.2600	.44309	50
The Medical Institutions Are Required To Categorise	4.4000	.49487	50
The frequency and patterns of code switching is changing	4.4800	.73512	50
continuously			

#### Table 3: Reliability Testing

(Source: Created by the learners)

Multicollinearity Analysis

A statistical phenomenon called multicollinearity describes a high level of inter correlations among the independent variables within a regression paradigm. Regression coefficients may become unstable and inaccurate as a consequence, making it challenging to understand the findings and formulate meaningful forecasts. Analysis of quantitative data frequently uses the multicollinearity assessment technique to identify and resolve this problem. In terms of dealing with multicollinearity, researchers employ a variety of techniques, including the removal of one or even more factors, the combining of several factors into a single composite parameter, or the application of different kind of regression model, including such ordinary least rectangles regression or exploratory factor regression. These techniques can assist in improving the precision and understandability of the linear regression while reducing the effects of multi collinearity on the outcomes. Researchers can enhance the precision and understandability of their regression analysis as well as the reliability of their forecasts using the information by tackling multicollinearity.

#### Descriptive Analysis

The supplied mean values are 1.5800, 1.7000, 2.6200, 2.4000, 2.3000, 2.7400, 2.0500, as well as 2.0200. The median values include 2.0000, 1.0000, 2.0000, 2.5000, 2.0000, and 1.0000. The mode attributes are 1.00, 1.00, 2.00, and 1. 00, and there are numerically many modes. A multi-modal dispersion is formed by the supplied mean, median, as well as mode values in the dataset. The dataset's mean equals 1.8258, its median is 2.0000, and its mode ranges between 1 and 2. The data's modest right skew has been shown by the mean's slight overshoot of the median, and the fact that the data are multi-modal shows the existence of two separate groups. This can be because the dataset contains data from two different populations, or it might be because there are outliers. The existence of two unique modes demonstrates that the 2 separate populations may be separated from one another, which is a crucial realisation for further investigation.

Table	4: Descript	tive Analys	31S

	Statistics																
																	Thefreque
																	ncyandpatt
					Theeducat		Doctorde	Behindthe		Therateofd			Patientsun	Differentco	Appointme	Themedic	ernsofcod
		Mostofthe		Itischallen	ionlevelof	Codeform	mographic	bolsterofc	Doctorde	octordemo	Thecharac	Codingof	derstandth	dingfordiff	ntofthedoc	alinstitutio	eswitching
		patientsar	Itisnecess	gingtomai	mostofthe	edicalregi	canhelpth	ulturalcom	mographic	graphicinfl	teristicsof	medicalre	ecodingoft	erentmedi	torscanch	nsarerequ	ischangin
		enotcomfo	arytochan	ntainasing	patientsisl	steriscom	eimprove	petencydo	alsocreate	uencedthe	doctordem	gisterchan	hemedical	calproced	angetheco	iredtocate	gcontinuo
		rtable	gecode	lecoding	ow	plex	ment	ctor	sahealthy	service	ographics	ges	register	ure	ding	gorise	usly
						_											
N	Valid	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
N	Valid Missing	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13	50 13
N Mean	Valid Missing	50 13 4.1800	50 13 4.5000	50 13 4.4800	50 13 4.3000	50 13 4.2000	50 13 4.3000	50 13 4.3800	50 13 4.5000	50 13 4.3000	50 13 4.2600	50 13 4.1200	50 13 4.2000	50 13 4.2400	50 13 4.2600	50 13 4.4000	50 13 4.4800
N Mean Median	Valid Missing	50 13 4.1800 4.0000	50 13 4.5000 5.0000	50 13 4.4800 4.0000	50 13 4.3000 4.0000	50 13 4.2000 4.0000	50 13 4.3000 4.0000	50 13 4.3800 4.0000	50 13 4.5000 4.5000	50 13 4.3000 4.0000	50 13 4.2600 4.5000	50 13 4.1200 4.0000	50 13 4.2000 4.0000	50 13 4.2400 4.0000	50 13 4.2600 4.0000	50 13 4.4000 4.0000	50 13 4.4800 5.0000
N Mean Median Mode	Valid Missing	50 13 4.1800 4.0000 4.00	50 13 4.5000 5.0000 5.00	50 13 4.4800 4.0000 4.00	50 13 4.3000 4.0000 4.00	50 13 4.2000 4.0000 4.00	50 13 4.3000 4.0000 4.00	50 13 4.3800 4.0000 4.00	50 13 4.5000 4.5000 4.00 <sup>a</sup>	50 13 4.3000 4.0000 4.00	50 13 4.2600 4.5000 5.00	50 13 4.1200 4.0000 4.00	50 13 4.2000 4.0000 4.00	50 13 4.2400 4.0000 4.00	50 13 4.2600 4.0000 4.00	50 13 4.4000 4.0000 4.00	50 13 4.4800 5.0000 5.00
N Mean Median Mode Std. Devia	Valid Missing tion	50 13 4.1800 4.0000 4.00 .69076	50 13 4.5000 5.0000 5.00 .73540	50 13 4.4800 4.0000 4.000 .50467	50 13 4.3000 4.0000 4.00 .46291	50 13 4.2000 4.000 4.00 .40406	50 13 4.3000 4.0000 4.00 .46291	50 13 4.3800 4.0000 4.000 4.00 .49031	50 13 4.5000 4.5000 4.00 <sup>a</sup> .50508	50 13 4.3000 4.0000 4.00 .46291	50 13 4.2600 4.5000 5.00 1.08440	50 13 4.1200 4.0000 4.00 .91785	50 13 4.2000 4.000 4.00 .57143	50 13 4.2400 4.0000 4.00 .47638	50 13 4.2600 4.0000 4.00 .44309	50 13 4.4000 4.0000 4.00 .49487	50 13 4.4800 5.0000 5.00 .73512

(Source: Created by Learners)

#### Regression

In the analysis of quantitative data, regression analysis has been a frequently used statistical technique for simulating the connection between a predictor variable and one or even more independent variables. In order to predict values for the predictor variables using the independent factors, a regression model or line must be fitted to a collection of points of data. The regression assessment produces two sets of findings: the regression formula, which specifies the connection between the factors, and the scores, which indicate the direction and degree of the association. In order to describe the connection between variables as well as make predictions, regression assessment is a frequently used technique in the analysis of quantitative data. In order to guarantee the reliability of the conclusions, it is vital to consider the regression framework's assumptions. This

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gives useful data on the magnitude and orientation of correlations between variables.

#### Normality, Non-responsive Bias and Homoscedasticity

In the analysis of quantitative data, normality, homoscedasticity, as well as nonresponse discrimination are crucial presumptions. The notion of normality relates to the presumption that a logistic model's returns or errors are regularly dispersed. This presumption is crucial for many sampling methods because it enables the use of procedures that rely on the normally distributed to draw conclusions about the population. The notion of homogeneity of variance is the idea that the variability of the residuals remains equal at all the independent factors levels.

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Table 5. Normality	Non-regnongive	Rige and	Homoscedastic	<b>1</b> 177
rabic 5. Normanty	non-responsive	Dias anu	TIOMOSCCUASU	JLΥ

Descriptive Statistics					
*	Ν	Skewness		Kurtosis	
	Statistic	Statistic	Std.	Statistic	Std.
			Error		Error
Most of the patients are not comfortable	50	-1.801	.337	8.206	.662
It is Necessary To Change Code	50	-2.405	.337	9.278	.662
It is Challenging To Maintain A Single	50	.083	.337	-2.078	.662
Coding					
The education level of most of the patients	50	.900	.337	-1.241	.662
is low					
Code for medical register complex	50	1.547	.337	.407	.662
Doctor Demographic Can Help The	50	.900	.337	-1.241	.662
Improvement					
Behind The Bolster Of Cultural	50	.510	.337	-1.814	.662
Competency Doctor					
Doctor demographic also creates a healthy	50	.000	.337	-2.085	.662
The Rate Of Doctor Demographic	50	.900	.337	-1.241	.662
Influenced The Service					
The Characteristics Of Doctor	50	-2.148	.337	4.471	.662
Demographics					
Coding Of Medical Register Changes	50	-2.225	.337	6.339	.662
Patient understand the coding of the	50	684	.337	3.488	.662
medical register					
Different Coding For Different Medical	50	.649	.337	138	.662
Procedure					
Appointment Of The doctors can change	50	1.128	.337	759	.662
the Coding					
The Medical Institutions Are Required To	50	.421	.337	-1.900	.662
Categorise					
The frequency and patterns of code	50	-2.336	.337	9.016	.662
switching is changing continuously					
Valid N (listwise)	50				

(Source: Created by Learners)

### **Outliers** Examinations

## Table 6: Outliers Examinations

Descriptive Statistics			
	Ν	Minimum	Maximum
Most of the patients are not comfortable	50	1.00	5.00
It is Necessary To Change Code	50	1.00	5.00
It is Challenging To Maintain A Single Coding	50	4.00	5.00
The education level of most of the patients is low	50	4.00	5.00
Code for medical register complex	50	4.00	5.00
Doctor Demographic Can Help The Improvement	50	4.00	5.00
Behind The Bolster Of Cultural Competency Doctor	50	4.00	5.00
Doctor demographic also creates a healthy	50	4.00	5.00
The Rate Of Doctor Demographic Influenced The Service	50	4.00	5.00
The Characteristics Of Doctor Demographics	50	1.00	5.00
Coding Of Medical Register Changes	50	1.00	5.00
Patient understand the coding of the medical register	50	2.00	5.00
Different Coding For Different Medical Procedure	50	3.00	5.00
Appointment Of The doctors can change the Coding	50	4.00	5.00
The Medical Institutions Are Required To Categorise	50	4.00	5.00
The frequency and patterns of code switching is	50	1.00	5.00
changing continuously			
Valid N (listwise)	50		

(Source: Created by Learner)

# Multiple Regression Analysis

# Table 7: Multiple Regression Analysis

Coefficients <sup>a</sup> Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
		В	Std. Error	Beta	-		Lower Bound	Upper Bound
1	(Constant)	4.840	2.748		1.761	.087	739	10.419
	Most of the patients are not comfortable	.229	.220	.215	1.039	.031	218	.676
	It is Necessary To Change Code	223	.170	223	-1.313	.020	568	.122
	It is Challenging To Maintain A Single Coding	.264	.237	.181	1.112	.027	218	.746
	The education level of most of the patients is low	479	.362	263	-1.324	.194	-1.212	.255
	Code for medical register complex	503	.267	317	-1.883	.007	-1.046	.039
	Doctor Demographic Can Help The Improvement	.127	.239	.085	.531	.060	359	.613
	Behind The Bolster Of Cultural Competency Doctor	390	.258	268	-1.511	.014	914	.134

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Coefficients <sup>a</sup>							
Model	Unstandardized Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	В	Std. Error	Beta	-		Lower Bound	Upper Bound
Doctor demographic also creates a healthy	.234	.262	.148	.893	.038	298	.767
The Rate Of Doctor Demographic Influenced The Service	026	.118	038	217	.083	266	.215
The Characteristics Of Doctor Demographics	.444	.142	.554	3.131	.004	.156	.732
Coding Of Medical Register Changes	345	.209	268	-1.655	.011	769	.078
Patient understand the coding of the medical register	.194	.288	.126	.674	.050	390	.778
Different Coding For Different Medical Procedure	063	.329	038	190	.085	732	.606
Appointment Of The doctors can change the Coding	.465	.277	.313	1.678	.010	098	1.028
a. Dependent Variable: The frequent	cy and pa	itterns of c	ode switching is	changing	contini	lousiv	

(Source: Created by Learner)

#### **R-Square** Testing

In sociolinguistic study, R-square analysis can be quite useful in assessing the power of the association between a numbers of variables. The degree of variance inside a dependent variable which is affected by the independent variable could be measured using R-square. The accuracy of the theory could then be assessed using this data, and decisions concerning the course of future study can be made with knowledge. R-square, for instance, might be researching this research to assess how strongly the usage of code mixing and the health register are related. In contrast, a lower R-square number would indicate that other variables might be more pertinent to the research. A significant R-square value might indicate that the usage of code switching has a substantial association with the medical register. The outcomes of R-square analysis can also be used to examine how well various models describe the connection between code mixing and the health register. R-square testing is a crucial technique in sociolinguistic research because it can reveal essential information about the interrelationships between factors. It can assist in determining the reliability of the hypothesis as well as the course of future scientific research in the background of this study.

#### Hypothesis Testing

According to the regression model all the hypotheses are confirmed. The variables which are supporting the first hypothesis are 'most of the patients are not comfortable, it is necessary to change code and it is challenging to maintain a single coding'. The variables that are supporting the second hypothesis are 'code for medical register complex, behind the bolster of cultural competency doctor, doctor demographic also creates a healthy and the characteristics of doctor demographics. The variable status supporting the third hypothesis are 'coding of medical register changes, patients understand the coding of the medical register and appointment of the doctors can change the coding'. The significant t score for these variables are equal to 0.05 or below that.

#### Summary

This chapter analyses the data collected from the survey and it is found that all the hypotheses constructed in this research can be confirmed or supported. It is also found that 14 variables from a total of 15 variables can be included in the regression model as those variables have the required reliability.

#### Discussion

The code switching process needed in every medical sector for better interactions between the doctor and the patients. There are many types of code switching used in the medical sectors according to the processes metaphorical switching, conversational switching and situational switching. the switching operations done by the medical representatives and the doctors and staff for better understanding with the patients. The renowned medical sectors analyse the major amount of patient backgrounds to implement the codes in their medical operation for a better cooperation with the patients.

The patients with the higher level of education have more theoretical and basic knowledge and better understanding of the languages. The highly educated patients will verify the medical registers and reports and they will also be able to use their basic medical knowledge and will carefully read and verify all the reports for better results. They can also build up more interactions with the doctors and the other medical representatives. The patients with the lower level of education will have many difficulties in the medical processes. The patients with lower levels of education can face problems identifying the medical reports and can find many difficulties communicating with the doctors. The lower level educated patients also lack understanding of the basic medical processes. The lower level educated patients can show lack of cooperation in the medical processes presented by the doctor. The Code Switching processes help the doctors to interact with the low level educated patients. Additionally the doctors use less medical registers to cooperate with these patients and they mainly use the conversational switching processes to describe the overall medical information and collect patients' response.

#### Conclusions

Numerous sociolinguistic elements, such as patient and doctor demographics and contextual circumstances, have an impact on the adoption of code-switching in medical registers. The employment of medical and non-medical registers in medical communication, for instance, is influenced by a variety of factors, including patient education level, age, and ethnicity as well as doctor ethnicity and cultural background. This concept of medical communication has been understood from this proposed study. Due to the lack of knowledge surrounding the issue of code flipping in medical registers and the impact of sociolinguistic factors on its use, there is a risk of misconceptions and miscommunication in medical communication. Additionally, this study has applications for both patients and medical personnel. Here, from this research it has been identified that code switching causes in medical communication and the factors that contribute to these issues. It is also clear from this research that it helps to ensure that patients get the best care possible and that doctors and other healthcare providers can communicate with their patients clearly. The social power relations between the healthcare professional and the patient are among the most significant contextual factors that influence code-switching in the medical record.

#### Recommendations

The process of code switching can be improved in several ways. Hospitals or specifically the medical industry can implement better technologies and technical registers to initiate the better code switching program. The staff of the medical faculty needs to be trained well to communicate using the code switching method. The doctors and patients should always keep a habit of exchanging dialogues in coded language to understand each other's point of view in the best possible manner. Medical industry should focus on its ethical uses without breaking rules or protocols. People should be trained to show mutual respect while using the code switching. Every staff can fit in well into their respective roles and responsibilities with proper implementation of the code switching. The problem is it is not implemented well into the medical industry. It will also help to maintain the secrecy of the people conversing. Implementation of code switching also needs to be assured with the maintenance of the secret information. The dialects and tone of every region need to be explored while communicating using the switching code. Medical authorities must do proper investigations in the hospitals to find the gap between the doctors and the patients.

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