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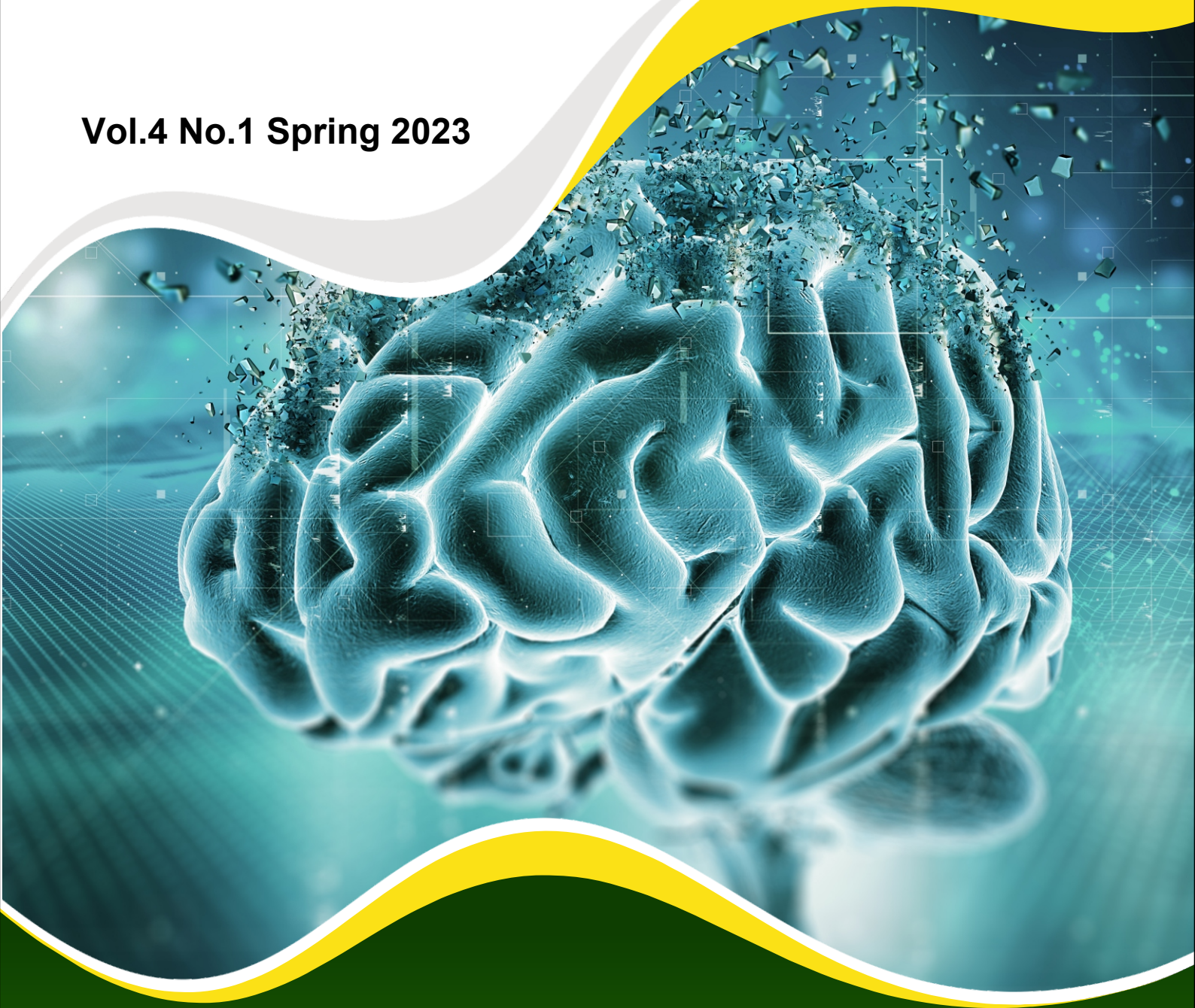

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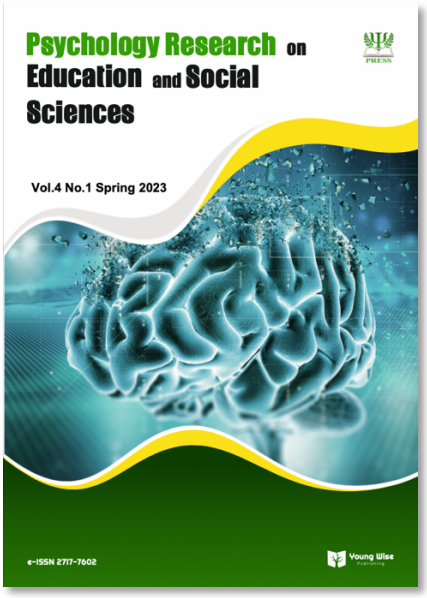

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Research Article

Self-control and grit: study on investors in the capital market

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Abstract

The COVID-19 pandemic has impacted various sectors, especially the economy. Investment in the capital market can be a solution, but it takes perseverance and hard work to get consistent profits in the capital market. This study aims to determine the effect of self-control on grit in the capital market. This study uses a purposive sampling method with a sample of 190 individuals who have made transactions during the last six months in the beginner Stock Investor Community (ISP) Malang using a grit scale (Duckworth, 2007) and a shortened version of the short self-control scale (Tangney, 2004). The results of hypothesis testing indicate that the hypothesis is accepted, which means that self-control can affect the grit of investors in the Indonesian capital market. Finding variables with a more significant impact on grit research needs to be continuously investigated.

To cite this article

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Introduction

The COVID-19 pandemic significantly impacted public health, education, social, cultural, psychological, sports, and religious (Wahyu & Sa'id, 2020). According to COVID-19's economic impact, there will be 0.56% more impoverished people in the world in 2020, including 1.3 million urban dwellers and 333.9 thousand rural residents. Additionally, 114,340 businesses have fired or laid off roughly 1,943,916 workers, representing 23% of the informal and 77% of the formal sectors (Ministry of Manpower, 2020). Workers were let off without severance compensation due to several recreation places being shuttered and construction operations ceasing (Meilianna and Purba, 2020).

When considered from an investor's perspective, the pandemic phenomenon presents the ideal chance to purchase shares because many stock sales have experienced price declines that have made them quite affordable (Phil, 2020). The Composite Stock Price Index (IHSG) value, which has dropped to 27.95% (OJK, 2020), demonstrates this. The JCI's drop to 27.95% represented both a setback to investors due to the loss in value and a chance for them to increase the value of their investment.

Investors must be relentless in their efforts to continuously learn, investigate, and consider all potential hazards while making investment decisions in the capital market. Grit, which is tenacity and drives to attain long-term goals set by the individual, is referred to as this persistence (Fannin et al., 2021; Jordan et al., 2019). According to research, grit predicts

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success in achieving difficult goals despite challenges, motivating people to strive tirelessly for years or even decades to attain the goal. (Duckworth and Gross, 2014) Grit is associated with professional success in various fields, including investment banking, painting, journalism, academia, medicine, and law (Fernández-Martn et al., 2020; Locke & Latham, 2013; Vallerand, Houlfort, & Forest, 2014; Wrzesniewski, 2012). People who are consistent with their interests and goals will persistently correct mistakes despite repeated failures.

For investors, perseverance can directly impact their financial preferences and investment choices (Bazley et al., 2021b). Therefore, according to Bazley et al. (2021a), grit can lessen the tendency of the disposition effect, allowing an investor with high grit to be more alert to investment losses. The disposition effect is the propensity for an investor to hang onto stocks when their price declines and sell them more quickly when their price rises (Hincapié-Salazar and Agudelo, 2020; Zahera and Bansal, 2019; Shefrin and Statman, 1985).

The psychology that underlies the grit mechanism is still the subject of much-undiscovered grit research. According to Duckworth and Gross (2014), self-control and grit are critical factors in determining an individual's success. According to Baumeister et al. (2007) and Tangney et al. (2018), self-control is the ability to modify behavior following ideals, values, morality, and societal expectations. Long-term academic success will benefit a person's ability to maintain self-control since they can avoid emotional disturbances impairing performance (Fisbach and Wooley, 2018; Tangney et al., 2004; Taylor et al., 2018). It demonstrates that exercising self-control is one strategy to prevent overspending in financial allocations in economics, finance, and investment (Supret and Pria, 2019; Pritazahara and Sriwidodo, 2015). According to Sekciska et al. (2020), self-control is positively connected with the propensity to invest but negatively correlated with the propensity to assume the investment risk.

Self-control and grit are the two elements that determine an individual's performance in a variety of facets of daily life, according to Duckworth and Gross (2014). Furthermore, Duckworth and Gross noted that grit and self-control are two concepts frequently used interchangeably. Studies on self-control and grit have been linked to tremendous academic success, particularly in the context of education and students (Luthans et al., 2019; Moffitt et al., 2011; Oriol et al., 2017; Sriram et al., 2018; Tough, 2012; Zettler, 2011), sports context (Tedesqui and Young, 2018), and healthy behavior (Marentes-Castillo et al., 2022).

Although both self-control and grit impact different areas, there has not been any research connecting the two in the context of investing and investors. Contrarily, when it comes to the investment phenomenon, people frequently deal with highly volatile price swings, forcing them to choose wisely (Bhowmik and Wang, 2020). Bazley et al. (2022) claim that grit affects investment choice. Investment choices also need to be made with self-control and after giving diverse factors significant thought (Berkman et al., 2017). This study intends to fill a knowledge gap on the role of self-control and grit in decision-making, particularly by investors.

Problem of Study

The pandemic situation offers an ideal opportunity to buy shares, the declining selling price of shares increases the affordability for some investors. Investors should continue to strive to continue to research, investigate and consider all possible risks when making investment decisions in the capital market. Self-control and grit are two factors that determine a person's performance in various aspects of daily life. Although self-control and grit operate in different domains, there has been no research linking the two in an investment context. Very volatile price changes in investment, forcing them to choose wisely. Grit influences investment choices. Investment choices should also be made after self-examination and thorough consideration of various factors. This study aims to determine the effect of self-control on grit in the capital market?

Method

Research Model

The type of this research is non-experimental research and included in descriptive correlational research. The independent variable is self-control as a predictor of grit in Indonesian capital market investors.

Participants

The participant in this study is a member of the beginner Stock Investor Community (ISP) Malang branch, which has 320 members and 190 respondents in the sample. Using the criterion of those who have made investment transactions in the previous six months, sampling was carried out using the purposive sampling technique.

Table 1. Demographic characteristics of the sample

Information		**Total (N=190)**	
		Frequency	**Percentage**
Gender	*Man*	115	60.5%
	Woman	75	39.5%
Age Group	*<20*	22	11.6%
	21-30	135	71.1%
	31-40	22	11.6%
	41-50	11	5.8%
Level of education	*High School Equivalent*	88	46.3%
	Diploma	13	6.8%
	S1	82	43.2%
	S2	7	3.7%
Work	*Student*	70	36.8%
	Private sector employee	66	34.7%
	Self-employed	28	14.7%
	civil servant	20	10.5%
	Housewife	6	3.2%
Investment Instrument	*Share*	62	32.6%
	Mutual Fund	26	13.7%
	Stocks and Mutual Funds	30	15.8%
	Stocks, Bonds, and Mutual Funds	30	15.8%
	Stocks, Mutual Funds, Bonds, Cryptocurrencies, Forex, Binary Options	22	11.6%
	Forex	20	10.5%
Transaction time	*<1 Year*	49	25.8%
	1-2 Years	81	42.6%
	3-4 Years	43	22.6%
	5-6 Years	17	8.9%

According to the descriptive analysis table, there are 190 responders across both variables. The grit variable ranges from a minimum of 12 to a maximum of 72. The standard deviation is ten, while the mean is 36. This also holds for the self-control factor.

Research Instruments

The variables of this research are measured by Grit Scale to measure the level of member of ISP Malang branch's grit and the Self-Control Scale to measure the member's self-control.

Grit Scale

The grit scale, created by Duckworth (2007), is used to gather data. It has 12 items total—6 positive and six negative—covering consistency of interest and perseverance. This scale has a reliability score of 0.706 and a validity range of 0.139 to 0.680.

Self Control Scale

The brief version of the Tangney (2004) self-control scale has 13 items, including nine unfavorable items and four unfavorable items, measuring self-control, deliberate/non-impulsive, healthy behaviors, work ethics, and reliability. This scale has a reliability rating of 0.87 and a validity range of 0.318–0.763.

Data Analysis

The back-to-back translation was used to adjust these scales (Brislin, 1970). Simple linear regression analysis was used to evaluate the hypothesis after the traditional assumptions of normality, linearity, and heteroscedasticity were examined. The next step was completed once the study's data had completed the traditional assumption test stage.

Table 2. Normality test

Variable	Significance	Information	Conclusion
Grit(Y)	0.200	p > 0.05	Normal
Self Control (X)	0.200	p > 0.05	Normal

In the normality test using *one sample, Kolmogorov-Smirnov*, the significance value is less than 0.05, *so* the data on both variables are normally distributed.

Table 3. Linearity Test

Information	Significance	Information	Conclusion
Deviation from Linearity	0.192	p > 0.05	Have a Linear Relationship between Variables

Based on table 6, the *deviation from the linearity* value is greater than the value of p> 0.05, meaning that there is a significant linear relationship between the self-control variables (X) and grit (Y*).*

Table 4. Heteroscedasticity test

Glejser method	Value Significance	Information	Conclusion
Self Control (X)	0.952	p > 0.05 _	Heteroscedasticity Free

Table 3's significance value was higher than 0.05, indicating that the data in this table do not exhibit any signs of heteroscedasticity when modeled using a regression technique.

Results

More men than women make up the sample for this study's demographic features. Most people are in their prime working years and have SMA and S1 education levels that are nearly comparable. The most prevalent occupations are students and private employees, who frequently use investment instruments in the form of shares with a transaction term of more than a year. Table 4 provides a detailed breakdown of the research sample's demographic information.

Table 5. Descriptive analysis of research variables

Variable	N	Min.	Max.	*mean*	Standard Deviation
Grit (Y)	190	12	72	36	10
Self Control (X)	190	12	72	36	10

Table 3 above indicates that no respondents have low grit; 59 respondents, or 31.1 percent, are in the medium category, and 131 respondents, or 68.9 percent, are in the high category. The following is the categorization of the grit variable based on hypothetical data. As shown in Table 4, only one respondent falls into the low group, while 97 respondents, or 51.1%, fall into the middle category, and 92 respondents, or 48.4%, fall into the high category.

Table 6. Simple Linear Regression Test Results

Variable	R	R Square	Sig	Information	Conclusion
Self-control over grit	,560	,313	0.000	< 0.05	Ha Accepted

According to Table 8, where a significant value of 0.000 < 0.05 was observed, Ho is disproved. Therefore, self-control is a predictor of grit for Indonesian investors in the capital markets. Additionally, it was discovered that the R square value was 0.313, indicating that self-control can influence grit by 31.3 percent, while other variables impact the remaining 8 percent.

Discussion and Conclusion

The findings demonstrated that grit predicts investor self-control in the Indonesian capital market. According to research by Duckworth and Gross (2014, Sriram, 2018), self-control is closely related to grit in the context of education and students (Luthans et al., 2019, Moffitt et al., 2011, Oriol et al., 2017, Sriram, et al., 2018, Tough, 2012, and Zettler, 2011). It is also strongly related to grit in sports (Tedesqui and Young, 2018), as Investors' grit is influenced by their high level of self-control in the Indonesian capital market. People with solid self-control may resist temptations because they can manage their impulses when presented with difficulties and temptations (Willems et al., 2019). Additionally, persons with self-control are less impulsive and better at achieving long-term objectives, or what is known as grit, since they can control their impulses, behavior, emotions, and concentration. It indicates that most respondents can control and steer their behavioral tendencies to accomplish the predetermined goals.

Since entrepreneurs must work hard to overcome obstacles and failures to succeed, these two factors are significant in the economic setting (Foo et al., 2009). When there is severe market volatility, most respondents with high grit continue to manage their portfolios by undertaking fundamental and technical analysis for investors to be more cognizant of investment losses and favor selecting portfolios with higher profit values (Bazley et al., 2021a).

Understanding how they relate to higher- and lower-level goals is crucial (Eskreis-Winkler et al., 2016). Investors need to set and reach goals to succeed because they give human actions in daily life purpose (Lapierre et al., 2017). Lower-level goals are strengthened by self-control, which aids people in achieving short-term goals and objectives. In contrast, grit is linked to the most challenging and significant objectives (Duckworth and Gross, 2014). A factor in the development of the studied grit investors is self-control. For grit to develop, people need to be around others who have high standards and can help them reach their goals, which in this study is self-control (Ross & Nisbett, 2011). In order to create high-impact interventions, this study helps us better understand the psychological processes of self-control and grit in a sample of investors (Duckworth and Gross, 2014; Walton, 2014). The findings of this study are anticipated to be generative, which can suggest new lines of inquiry for both basic science and interventional research.

Based on the research and debate findings, it can be said that the study's hypothesis -that self-control influences investors' grit in the Indonesian capital market- is accepted.

Recommendations

The following recommendations are offered to traders and investors: 1) exercise more self-control when making decisions to lessen the possibility of losses brought on by impulsive actions; 2) broaden knowledge, particularly concerning stocks or other investment instruments, through books, webinars, and training; 3) increase the accuracy of technical, fundamental, macro, and microeconomic analysis as well as other types of analysis; and 4) carry out evaluations. The three recommendations are meant to increase the likelihood of obtaining maximum and steady profits. Suggestions for future researchers to conduct research on different topics or expand the number of research respondents to boost the representative value. Finding variables with a more significant impact on grit research needs to be continuously investigated.

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Research Article

The risk stratification of the diabetic foot and foot neuropathy in patients in the greater Durban area

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Diabetes Foot Screening and Risk Stratification
Diabetic foot ulcers (DFUs)
Foot neuropathy
Lower extremity amputations (LEAs)

Abstract

With the rapid growth of diabetes, there are increased complications, particularly in patients' lower limbs. Diabetic foot ulcers affect 10-20% of the diabetic population. Early detection and management of risk factors can significantly reduce the development of diabetic foot ulcers and prevent foot amputation. A risk stratification tool can detect these risk factors and avoid amputation. This study aimed to identify and categorise diabetic patients into risk categories based on their diabetic foot status. The study was conducted in the greater Durban area in the KwaZulu-Natal province. The authors used a cross-sectional observational study design. The study population consisted of 155 diabetic patients. The Diabetes Foot Screening and Risk Stratification Form were used as data collection instruments. The study found that several patients who presented with diabetes were potential candidates for diabetic foot ulcers, and these patients needed immediate attention and care. Furthermore, it was identified that more males presented with diabetes and foot complications in the Durban area than females. From the results, it was concluded that diabetic patients should become conscious of foot care. Foot care education is recommended, and patients should be made aware of foot care, self-examination, and the need for medical attention.

To cite this article

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Introduction

The prevalence of diabetes is increasing worldwide [World Health Organisation (WHO), 2019]. Purbhoo and Swart (2015) found that many patients consulting at podiatry clinics in Johannesburg had diabetes. The number of patients presenting with diabetic foot ulcers (DFUs) and lower extremity amputations (LEAs) globally has significantly increased (Mehta *et al*., 2009). There is a 15% greater chance of foot ulcerations and amputations within the diabetic population if early treatment is not received (Shearman, 2015). Many individuals who develop diabetic peripheral neuropathy (DPN) often experience a loss of sensation in their feet. These include the sensation of light touch, pressure, pain, and temperature. Foot pathologies are often linked to an increased risk of an individual developing a DFU and undergoing LEA (Shearman, 2015; Atsona & Larbie, 2019). Due to a lack of sensation, diabetic patients are at a greater risk of injuring their feet without knowing (Vinik *et al*., 2018).

Diabetes is the fourth major cause of death in KwaZulu Natal. Between 2006-2015, an estimated increase of 305% of diabetic patients visited clinics in Durban (Department of Health-KZN, 2018). Of the 11 districts, Durban has the highest percentage (36.68%) of registered diabetic patients (Sahadew & Singaram, 2019), thus causing financial burdens to the health sector (Vileikyte, 2001). Early detection of diabetic foot pathologies can significantly reduce the risk of

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DFU and LEA, thus reducing the social and economic strain on patients and the healthcare sector (Monteiro-Soares *et al*., 2012; Shearman, 2015). Therefore, Ntuli *et al*. (2018) recommended podiatric treatment as part of the primary healthcare system, where diabetic patients receive appropriate medical treatment and accurate assessment of the patient's feet (Fernandez-Torres *et al*., 2020).

The diabetic foot ulcer risk stratification tool is an example of an assessment tool that can be used to screen patients. This tool allows for identifying and predicting patients who are likely to develop pathologies that can lead to LEAs. It will enable health practitioners to categorise and prioritise patients to prevent DFUs and LEAs (Gordon & Bitton, 2013). Risk stratifications can and should involve regimes and algorithms, although the data and results are highly dependent on the examination by the healthcare practitioner (Monteiro-Soares *et al.*, 2012). This study aimed to identify and categorise diabetic patients into risk categories based on their diabetic foot status. The patients presented themselves at the podiatry clinics in the greater Durban area.

The Diabetic Foot Risk Stratification

Diabetic foot risk stratification identifies clinical features of individuals with diabetes predictive of the relative risk of foot ulceration (Crawford *et al*., 2007). Akinbode and Yewande (2017) stated that 80% of diabetic-related amputations are preventable with early detection and intervention; Ntuli *et al*. (2018) agree that early intervention is a significant preventative measure. Due to limited data on diabetic foot risk stratification in South Africa, this study seeks to identify, document, and describe diabetic foot risk stratification of patients in the greater Durban area.

Diabetic Foot Complications

Diabetes mellitus is a rapidly growing disease affecting the public and private health sectors (Shearman, 2015). In South Africa, according to van Wyk and Mostert (2018), almost 10% of the population has diabetes, with type 2 diabetes being the more prevalent. In Durban, an average of six lower limb amputations are performed daily (Mbatha, 2017); almost. In 2018, it was reported that estimated f 2500 amputations per annum were performed in the public health sector due to diabetes (KZN Department of Health, 2018). Mehta *et al.* (2009) state that chronic and uncontrolled diabetes often leads to the feet developing macro and microvascular disease, peripheral neuropathy and structural changes. They further state that diabetic foot diseases occur when an individual has diabetic peripheral neuropathy (DPN) and PAD factors.

Diabetic Peripheral Neuropathy (DPN)

DPN is a symmetrical, length-dependent, sensorimotor polyneuropathy that is due to prolonged elevated blood glucose levels. Depending on the onset of diabetes, blood glucose control, and age, DPN can be prevalent in up to 50% of these individuals (Yates, 2012). Up to 30% of people with diabetes can experience symptoms of neuropathy. Individuals with DPN can develop atrophy in the small muscle of the foot; this can cause abnormal plantar pressure due to an increase in bony prominences and a loss of supportive surface (Frowen *et al.*, 2012).

Diabetic Foot Ulcers

Diabetic foot disease, including DPN and PAD, can affect one-third of the global diabetic population, increasing this figure (Levy & Gilbrand, 2019). This can lead to an increase in DFUs, resulting in amputation. DFUs can be classified as neuropathic, ischemic, or neuro-ischemic, which can be found with or without infection. These incidences of uncontrolled diabetes significantly increase the risk of infection, which could result in amputation (Shearman, 2015).

Peripheral Arterial Diseases

Arterial diseases are considered the most dangerous form of circulatory pathologies, as arterial diseases can significantly decrease one's quality of life and result in the loss of limbs (Frowen *et al.,* 2012). The diabetic foot can be affected by PAD with or without a history of trauma and infection (Frowen *et al*., 2012). Sherman (2015) noted that the risk of developing PAD is up to four times higher in the diabetic population and 8% of people with type two diabetes have

PAD. Within the diabetic population, the risk of lower limb amputations can be estimated between 10 and 16 folds compared to the non-diabetic population (Sherman, 2015).

Distal PAD can commonly affect the hands and feet, although it is more prevalent in the feet. Often in the diabetic population, bilateral, multi-segmented and distal ischemia is caused by arteriosclerosis affecting vessels below the knee (Frowen *et al.*, 2012). Around 50% of people who develop PAD are asymptomatic and approximately 33% have atypical symptoms. PAD may cause wounds on the limb that are often difficult to heal and are prone to infection (IDF, 2019).

DFU Risk Factors

The development of DFU is multifactorial and is highly influenced by blood glucose levels. The combination of DPN and PAD increases the risk of DFU. Structural foot pathology, ill-fitting footwear, poor foot hygiene, and trauma have been linked to the development of DFU (Levy & Gilbrand, 2019).

Age and Gender

Diabetes Mellitus (DM) was once considered a condition that mainly affected the elderly population; now, it has become more prevalent in the 'under-age' group (those of a younger age group). The IDF (2019) research estimated that 19.3% of people between 69 and 99 years have diabetes. According to Ramkisson *et al*. (2016), it is estimated that there are 7% of people aged between 20-79 have Type 2 diabetes. Gender differences play a vital role in living effectively with diabetes. Males living with diabetes display a better-coping mechanism than females; however, separate studies by Purbhoo & Swart (2015) and Mokena *et al*. (2017) identified that more females participated in podiatry studies in South Africa.

Problem of Study

Diabetes is a rapidly growing global epidemic. South Africa has the most significant number of people living with diabetes in Africa. With the rapid growth of diabetes, there is an increase in related complications, particularly in the lower limb. Research has found that complications of diabetes that affect the feet are peripheral neuropathy, peripheral arterial disease, structural foot deformities, diabetic foot ulcers and lower-extremity amputations. Diabetic foot ulcers are known to affect 10-20% of the diabetic population. Global statistics indicate that lower limb amputation is performed; 85% of the cases are due to diabetes. Podiatrists play a crucial role in the management of diabetic foot care. Early detections and management of risk factors can significantly reduce the development of diabetic foot ulcers and prevent foot amputation. Research has shown that diabetes is rapidly increasing among the Indian population in the greater Durban area. Studies by Sahadew and Singaram (2019) and the Department of Health in KwaZulu Natal found that almost 305% of diabetic patients visited clinics in Durban. For this reason, the researcher focused on the diabetic patients in the greater Durban area to minimise and support patients through podiatry care and treatment.

A scarcity of data and published literature within the South African context regarding the risk factors of the diabetic population in developing foot or lower limb-related complications such as DFU and LEA provided the rationale for this type of study to be conducted. Anecdotal observation by the researcher identified that most patients consulting for podiatric treatment in the Durban area were diabetic, with little to no knowledge of their risk category and presenting diabetic lower limb complications at the first consultation. This study aimed to identify and categorise diabetic patients into risk categories based on their diabetic foot status. The study was conducted in the greater Durban area in the KwaZulu-Natal province.

Method

Study Design

A cross-sectional observational study design was used in this research. The research setting was the researcher's practice in the greater Durban area in KZN province in South Africa. The three practices used to collect data are Chatsworth, Amanzimtoti and Umkomaas.

Sample

The study population included a total of 155 patients. Due to the COVID-19 pandemic, many patients did not present themselves at the clinic. Patients over 18 years and who had diabetes were included in the study. This study examined two independent variables: gender and age of diabetic patients with NIDD or IDD. The findings in the study revealed that more males (52%) participated in comparison to females (48%). It was found that 47.7% of the participants were older than 65% and 0.6% below 20 years of age.

Data Collection

The data was collected over four months, from January 2020 to April 2020. Data were collected by conducting individual face-to-face interviews using the risk stratification tool designed by the SDFAG. The researcher took approximately 20 minutes with each participant to complete the instrument. This was done when participants came in for a consult, where the researcher informed them of the study.

Data Analysis

The data were analysed and the frequencies were presented in tables by Statkon. Descriptive statistics and frequencies were used to categorise patients with a low, medium, and high risk of diabetes. The results were introduced in the form of frequency tables. The researcher categorised patients into low, moderate, and high-risk categories and identified the prevalence of these categories within different age groups and gender.

Ethical Consideration

Permission to conduct this study was approved by the Departmental Research Committee of Podiatry, the Higher Degree Committee of the Faculty of Health Science, and ethical clearance from the Health Sciences Research Ethics committee – reference Rec-192-2019. Signed informed consent was obtained from each patient before the interview.

Results

Clinical Data

Clinical data is collected during ongoing patient care or as part of a formal clinical trial program to inform guidelines and practices (Lu & Su, 2010; Masic et al., 2008For this study, clinical data was collected from all diabetic patients. The clinical data gathered included the patient's diabetes type, pharmacological treatment, duration of diabetes, HbA1c profile of patients, and random blood glucose readings.

According to the data, 98.1% of participating patients were diagnosed with NIDD (Type 2) diabetes. A high percentage, 70.6%, were using oral anti-glycaemic agents (OHA) as part of their treatment compared to 7.2% who were using insulin. Regarding the duration of their diabetes, 76.2% of these patients were diagnosed for 15 years or less. To understand the HbA1c profile of the patients, the researcher found that most patients, 75.5% (n=117), did not know their latest HbA1c result, nor had they gone for testing at the time of the data collection.

Diabetic Foot Screening Examination

Neurological assessment was conducted using a 10g monofilament to detect the loss of protective sensation and neuropathic pain symptoms. It was found that 13.5% were identified as having loss of protective sensation and 36.1% experienced some form of painful neuropathy. During the vascular assessment, using a handheld Doppler to assess the pedal pulses and questions relating to the possibility of intermittent claudication, rest/night pains and previous vascular surgeries performed, the finding showed 8.4% experienced rest/night pain and 9.7% intermittent claudication.

Risk Factors

Table 1 presents the risk factors predisposing patients to develop a DFU and/or LEA

Table 1. Risk factors for the development of DFU's and LEA's

	Frequency		**Percent**		**Total**	
	Yes	No	Yes	No		
Did the patient have a previous amputation?	4	151	2.6%	97.4%	155	100%
Did the patient have a previous ulcer?	18	137	11.6%	88.4%	155	100%

Does the patient have significant structural foot deformities?	8	147	5.2%	94.8%	155	100%
Does the patient have significant callous/pre-ulcerative lesions?	11	144	7.1%	92.9%	155	100%
Does the patient have end-stage renal failure	1	154	0.6%	99.4%	155	100%
Does the patient fall under the Maori ethnicity	0	155	0.0%	100.0%	155	100%
Is the patient capable or has help to self-manage foot care	141	14	91.0%	9.0%	155	100%

When the researcher categorised the risk factors into low, moderate or high-risk, the finding highlighted 62.6% as low, moderate (21.9%), high (8.4%) and 7.1% of patients with active foot disease

Correlations between risk profile vs. the duration of diabetes

The *p*-value (<0.05) in Table 2 indicates a statistically significant relationship between risk profile and duration of diabetes. There appears to be a higher percentage of moderate and high-risk patients in those who were diagnosed for 10 years or longer. The results indicate that the risk of developing DFUs and LEAs increases, the longer the duration of diabetes.

Table 2. Correlations between risk profile vs the duration of diabetes

			Risk categories			**Total**
			Low-risk foot	Moderate risk foot	High-risk foot / Active foot disease	
Duration of diabetes	10 years or less	Count	40	7	2	49
		% within rA5	81.6%	14.3%	4.1%	100.0%
	+ 10 years	Count	29	17	10	56
		% within rA5	51.8%	30.4%	17.9%	100.0%
Total		Count	69	24	12	105
		% within rA5	65.7%	22.9%	11.4%	100.0%

Table 3. Chi-Square tests between risk profile vs the duration of diabetes

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.835a	2	0.004
Likelihood Ratio	11.413	2	0.003
Linear-by-Linear Association	10.332	1	0.001
No. of Valid Cases	105		

a. 0 cells (0%) have an expected count of less than 5. The minimum expected count is 5,60.

Correlations between risk profiles vs. age groups

The *p*-value (>0.05) in Tables 4 and 5 indicates a statistically insignificant relationship between risk profile and age. The results have demonstrated that the risk of developing DFUs and LEAs remains equally probable in any age category.

Table 4. Correlations between risk profiles vs age groups

			Risk categories			Total
			Low-risk foot	Moderate risk foot	High-risk foot / Active foot disease	
Age (in complete years)	65 years or younger	Count	56	13	12	81
		% within rA1	69.1%	16.0%	14.8%	100.0%
	+ 65 years	Count	41	21	12	74
		% within rA1	55.4%	28.4%	16.2%	100.0%
Total		Count	97	34	24	155
		% within rA1	62.6%	21.9%	15.5%	100.0%

Table 5. Chi-Square tests between risk profiles and age

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.894[a]	2	0.143
Likelihood Ratio	3.913	2	0.141
Linear-by-Linear Association	1.574	1	0.210
N of Valid Cases	155		

a. 0 cells (0%) have an expected count of less than 5. The minimum expected count is 11,46.

Correlations between risk profile vs. sex

The *p*-value (>0.05) in Tables 6 and 7 indicates a statistically insignificant relationship between risk profile and gender. The results suggested that the risk of developing DFUs and LEAs remains equally probable in any gender.

Table 6. Correlations between risk profiles vs sex

			Risk categories			Total
			Low-risk foot	Moderate risk foot	High-risk foot/ Active foot disease	
Sex	Male	Count	49	16	16	81
		% within A2	60.5%	19.8%	19.8%	100.0%
	Female	Count	48	18	8	74
		% within A2	64.9%	24.3%	10.8%	100.0%
Total		Count	97	34	24	155
		% within A2	62.6%	21.9%	15.5%	100.0%

Table 7. Chi-Square tests between risk profiles and sex

	Value	**df**	**Asymptotic Sig. (2-sided)**
Pearson Chi-Square	7.267[a]	3	0.064
Likelihood Ratio	8.436	3	0.038
Linear-by-Linear Association	2.724	1	0.099
N of Valid Cases	155		

a. 0 cells (0%) have an expected count of less than 5. The minimum expected count is 5,25.

Discussion

Patient Demographic Data

According to Cardiovascular Diabetes Education (n.d.), 90% of diabetic patients are diagnosed with type 2 diabetes. In the South African population, the incidence of type 2 diabetes varies between 3% and 28.7%, with the highest prevalence found amongst the Durban Indian community (Groenewald *et al.,* 2014). For example, some ethnic groups, for example, the Indian community, are more likely to develop diabetes, and the current study found that 100% (n=155) were of Indian descent. Simmons (2019) found that males are more likely to develop type 2 diabetes than females; the findings in this study revealed that marginally more males (52%) than females 48% presented with diabetes.

The IDF (2019) highlights that 12.5% of the adult population (20-79 years) are living with diabetes and a national survey across India indicated a higher prevalence of diabetes amongst the ageing population; 23.8% aged between 45-59 years old and 36.8% aged over 60 years (Statista Research Department, 2020). This trend can be seen in the current study; 94.2% of diabetic participants were over 41 years old. Huizen (2019) indicated that people over 45 years have a greater chance of developing type 2 diabetes.

The current study indicated that 70.6% of the patients used oral hypoglycaemic agents (OHA) as part of their diabetic treatment. Metformin is used as the drug of choice upon diagnosis (CDE Guideline, 2018). Furthermore, 20.3% of patients undergo OHA's and insulin; the CDE guidelines (2018) suggest that type 2 diabetic patients should be placed on insulin therapy if oral treatment fails. These statistics correlate with the higher prevalence of type 2 diabetes.

Foma *et al.* (2013) indicated that many complications caused by uncontrolled diabetes could be prevented via dietary modifications; these authors mention that a tiny population knew that diabetes could be controlled with dietary changes and exercise. The lack of awareness concurs with the current study which found that 2% of the population indicated changes in diet to control their diabetes.

According to Gurung *et al.* (2018), patients who lacked information and were non-compliant with their diabetic treatment had a higher chance of developing diabetes-related complications. The current study showed that 32.3% of

the patients could not provide any information on how long they have been living with diabetes, and for those who did respond, the majority (76.2%) have had diabetes for 15 years or less. Gurung *et al.* (2018) further stated that patients diagnosed with diabetes for five or more years were at risk of developing diabetic-related complications.

The CDE Clinical Guidelines (2018) indicated that the targeted HbA1c for adults should be 7%. The current study results indicated that the lowest HbA1c reported was 5.2%, and the highest HbA1c said was 13%. Studies have shown that people with an increased HbA1c baseline have a greater risk of developing diabetic-related complications such as DFU and LEA (Cefalu *et al.,* 2013). According to the Journal of Endocrinology Metabolism and Diabetes in South Africa (JEMDSA) (2017) guidelines, diabetic patients are advised to aim and maintain an HbA1c <= 7%. In the current study, 47.4% of patients whose HbA1c was recorded could achieve an HbA1c <=7%.

Risk Factors Leading to DFU and LEA

The development of DFU and LEA is multifactorial and varies from diabetic peripheral neuropathy, peripheral vascular diseases, foot structure, glycaemic control, general foot care and many other factors.

Peripheral Neuropathy

As the global prevalence of diabetes increases, so do complications such as DPN. DPN must be detected in its early stages. It can cause sensory abnormalities in the early stages, such as pain, numbness, loss of sensation, and hardening of the limbs (Chou *et al.*, 2019). Alexiadou and Doupis (2012) stated that neuropathy is the common factor presenting in 90% of all diabetic foot ulcers and that DPN and PAD are associated with LEA, while neuropathy alone was not independently associated with LEA.

McAra (2011) identified that 78% of patients who presented with neuropathic symptoms assumed that their protective sensations were intact. However, 53% of McAra's (2011) study population was diagnosed with a lack of protective sensation, and these patients were not aware of the presence of the pathology. The current study indicated that only 13.5% of patients were diagnosed with loss of protective sensation.

A study performed in South Africa indicated that the most common form of DPN was symptoms of burning, numbness and pins and needles. Bogoshi *et al.* (2014) indicated that 67.7% of patients complained of moderate pain and 11.7% reported extreme pain or discomfort. Furthermore, DPN pain caused nearly half the patients in the study to suffer from anxiety and depression. The current research shows that only 36.1% of patients experienced neuropathic pain.

The monofilament is a quick and cheap way to detect the early onset of DPN, which can then be used to reduce limb amputation by 85% and DFU by 60% through education and therapeutic footwear (Babitha & Subathra, 2020). In this study, 12 points were tested using the monofilament; patients who could perceive 11 points or less were diagnosed with having loss of protective sensation. In the current study, 13.5% of patients were diagnosed with having loss of protective sensation. 65.2% of the patients had perceived all 6 points on the left foot and 63.2% on the right foot. The study found that 18.1% could not detect a single application on the left foot and 17.4% on the right foot. This study found that both feet are equally affected by the loss of protective sensation. The findings of this study contradict McAra's (2011) on patients' awareness of the loss of protective sensation in the diabetic foot; she found that 78% of the study population assumed that their protective sensation was intact. However, only 25% were correct in this assumption, indicating more patients with a loss of protective sensation.

Patients' lack of awareness and education regarding the loss of protective pedal sensation recommends the need for effective diabetes education programs to prevent DFU and LEA (Burke *et al.,* 2014). Early education and awareness of diabetes are crucial in managing an unnoticed injury to the feet (Yates, 2012; Frowen *et al*., 2012).

The findings in this study showed a significantly lower prevalence of DPN than in other studies. This could be because 76.2% of the patients have been living with diabetes for less than 15 years and almost half (47.4%) of patients have an HbA1c result <=7%.

Vascular Pathologies

According to Hawkins and Jaff (2013), the longer the duration of diabetes, the greater the risk of developing PAD (Hawkins & Jaff, 2013). According to the IDF (2019), 50% of people who develop PAD are asymptomatic and approximately 33% have atypical symptoms.

The American Endovascular and Amputation Prevention (2020) states that pain in the back of the leg during walking is the most common sign of vascular pathologies. This pain is known as intermittent claudication and is caused by a lack of blood supply to the muscle due to plaque build within the arteries. In this study, 9.7% of patients were diagnosed with intermittent claudication.

According to the American Diabetes Association (2003), more severe forms of PAD include rest pain, tissue loss or gangrene. The current study indicated–that rest/night pain symptoms were the second-highest reported vascular pathology, affecting 8.4% of patients. Forlee (2010) states that many patients may not experience rest/night pain even with extensive tissue loss due to the presence of DPN. Rest pain is often seen in critical limb ischemia (CLI) because of reduced blood supply to the surrounding tissue. This, in turn, dramatically increases the risk of DFU and LEA (Jorneskog, 2012). In 90% of LEA in diabetic patients, CLI is the main causative factor.

The Vascular Centre (2019) in Cape Town states that all diabetic patients are at risk of an LEA and 70%-80% of all non-traumatic amputations occur in patients living with uncontrolled diabetes. This study identified that 0.6% of the participants had a lower limb amputation. Unfortunately, once a patient living with diabetes has had an LEA, the chances of having another amputation on the other limb are as high as 68% (Vascular Centre, 2019).

The severity and duration of diabetes are significant predictors of both the extent and incidence of vascular pathologies such as PAD. This study found a low prevalence of vascular pathologies. This is because two-thirds of the patients were living with diabetes for 15 years or less, and almost half of them had reasonable glycaemic control.

Significant Structural Foot Deformities and Calluses/Pre-Ulcerative Lesions

The development of motor neuropathy can cause muscular weakness resulting in an abnormal balance between the flexor and extensors of the foot. Common structural foot deformities such as hammertoes, claw toes, pes cavoid and prominent metatarsal heads are caused by such muscular weaknesses. 5.2% of the patients in the current study presented with a structural foot deformity.

Calluses are thick, hardened layers of skin that develop when the skin tries to protect itself against friction and excessive pressure. When these thickened layers of skin are stepped on repetitively, they increase the risk of developing a DFU (Frowen *et al.,* 2012). Foot deformities such as prominent metatarsal heads are considered the leading factor of DFU (Ledoux *et al*., 2013). The study found 7.1 % of these patients had significant callus growth or a pre-ulcerative lesion. The findings correlate with Thompson *et al.* (2021), who found that almost 25% of patients also presented with callus formation.

Furthermore, Tang *et al.* (2015) also found that 53% of patients presented with callosities in the heel region. In terms of prevention strategies, the authors recommend that insoles and shoes be widely prescribed to protect the feet and redistribute the plantar pressure to prevent the development of DFU. According to Arosi *et al. (*2016), callus formation is linked to motor neuropathy causing foot deformities leading to abnormal plantar pressure and callus development.

Diabetic Foot Ulcers

Diabetic foot ulcers are common, stressful, expensive and life-threatening pathologies associated with significant impairment of the quality of life (Boulton & Whitehouse, 2020). DFU often occurs in combination with neurological and vascular pathologies and structural deformities of the foot (Mehta *et al.,* 2009). This combination of pathologies often leads to tissue destruction and hence the development of the DFU. Around 10% of the diabetic population experience these pathologies, often leading to a DFU. Allen-Taylor *et al.* (2002) noted that 20% of all patients living with a DFU have impaired blood supply to the lower limbs, and these patients are prone to delayed wound healing and an increased risk of infection and LEA. Thirty percent of DFUs have a combination of neurological and vascular pathologies, whereas 50% of DFUs are neuropathic. As indicated previously, the current study results show a lower

prevalence of vascular and neurological complications and, as such, could account for the lower prevalence (7.1%) of active foot ulcers in this population. In an unpublished dissertation by Mokoena *et al.* (2017), 12.53% of diabetic patients at a public hospital presented with diabetic foot ulcers. The prevalence of DFU in Ghana has been identified as 11% at tertiary institutions and in Ethiopia, the prevalence of DFU has been identified as 11.6% (Abdissa *et al.,* 2020).

However, because the current study collected data from private practices, the results are significantly lower than those obtained from the two tertiary academic public hospitals. The disparity could be one of the differences in socioeconomic status between Africa and South Africa. Purbhoo and Swart (2015) found that many health problems, including foot problems, are caused by various historical, cultural, and socioeconomic factors influencing lifestyles. Due to the high poverty rate and financial constraints, most patients (80%) must visit provincial healthcare facilities (Webb et al., 2019). In South Africa, most diabetes care occurs at PHC facilities, where screening for diabetic complications is often low. This statement correlates with the findings by Tumbo and Kadima (2013) in the Northwest Province in South Africa. Webb *et al.* (2019) state that clinics require access to equipment, resources, and a functional health system to screen effectively. They found that no clinics had monofilaments available in the Tshwane District in Pretoria and were poorly resourced to screen diabetic patients.

Risk Stratification

The data gathered indicated that 62.6% of patients were placed into low-risk categories for developing DFU and LEA. Although the prevalence of uncontrolled diabetes is higher, most patients were not at risk for developing DFU and LEA. This could be because 76.2% of patients who participated in the study lived with diabetes for less than 15 years. This finding correlates with Ahmadi *et al.* (2018) as they described the duration of diabetes being a causative risk factor for microvascular diseases, neuropathy and DFU.

The most significant number of patients were found in the low-risk category, 69.1% were under 65, and 55.4% were over 65. The results indicate that the risk of developing DFUs and LEAs remains equally probable in any age category. Other risk factors such as foot hygiene, duration of diabetes, neuropathy, vascular disease, structural foot deformities and glycaemic control are more significant contributing factors to developing DFU and LEA (Shearman, 2015; Levy & Gilbrand, 2019).

The results from this study indicated that the risk of developing DFUs and LEAs remains equally probable between the genders. Although studies by Dinh and Veves (2008) note that females are less likely to develop DFU when compared to males due to them presenting with minor server neuropathic pathologies, an increase in joint mobility and a decrease in plantar foot pressure. However, if PAD, PDN or other risk factors develop, females will be at an equal risk of DFU and LEA (Dinh & Veves, 2008).

Conclusion and Recommendations

Based on the results of the study, the following are recommended to minimise DFU and LEA among diabetic patients: ongoing foot screening for the risk of DFU and LEA should become an essential service at all podiatry practices; foot care and education become an integral part of the well-being of diabetic patients; patients should be provided with knowledge of self-examination, appropriate footwear and immediate medical attention should they experience foot pain and discomfort. It is also recommended that areas should be identified as diabetic hotspots and podiatry services made available.

Since diabetes is rapidly growing with devastating complications, the role of podiatrists is crucial in diagnosing and treating pathologies affecting the lower limb.

Although various studies indicate the prevalence of diabetic complications affecting the lower limb, many participants in this study were placed into a low-risk category. The current study shows a significantly lower prevalence of DPN and vascular pathology than other studies. This could be because 76.2% of the patients lived with diabetes for less than 15 years and almost half (47.4%) had an HbA1c result <=7%.

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Conflict of Interest

The authors declare that there is no known conflict of interest or competing financial interest or personal relationships that could have influenced this paper.

Author's Contribution Statement

The authors declare that they have both conceptualised and written this paper together. This paper emanated from the first author's master's study.

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Research Article

How is the relationship between hopelessness and suicidal ideation in adolescents?

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Abstract

The number of adolescents who suicide has increased from year to year. Suicidal behavior begins with suicidal ideation. There is a positive relationship between suicidal ideation and suicidal behavior. In other words, suicidal ideation is a trigger for suicidal behavior. The main factor of suicidal ideation is a psychological condition, especially related to hopelessness. This study aimed to analyze the relationship between hopelessness and suicidal ideation in adolescents. The research method is quantitative with a correlational design. Participants were 100 youth aged 15-20 years. Data were collected using the Beck Hopelessness Scale (BHS) by Beck, et al (1974) and the Beck Scale for Suicidal Ideation (BSS) by Beck (1979). The data were analyzed using Pearson's Product Moment correlation. The results of the data analysis showed that there was a significant positive correlation (r = 0.749; p = 0.001) between hopelessness and suicidal ideation among adolescents. This study concludes that the higher the level of hopelessness, the higher the suicidal ideation in adolescents, and conversely the lower the hopelessness, the lower the suicidal ideation.

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Introduction

Adolescent stage is one of the stages with its own development role. The stage begins from the age of 12 to 20, which considered as the most important stage in human development since it must reach a sufficient level of identity. The role of search for identity will lead the adolescents to experience their roles and capabilities for meeting pre-established goals, but at this stage they tend see themselves as unrealistic because of perceiving themselves or others as they expected and not as they really are, and causes disappointment if difference arises between desires and realities and other people or themselves fails to achieve the pre-established goals. This difference also causes the adolescents suffer inferiority and feel worthless which turns to depression or even suicidal attempt (Marliani, 2016).

In the survey conducted in 2015 called Global School-Based Student Healt Survey, a cooperation between WHO and Ministry of Health of Republic of Indonesia on junior and senior high school students at the ages of 12 – 18 concerning Health in Adolescent from various provinces. The results show that 3.8% of adolescents have attempted suicide at least once, 5.7% of adolescents have planned to suicide, and 5.5% of adolescents have suicidal ideation in the last 12 months. The suicidal ideation is now increasingly found among adolescents, even if they are abnormal idea for adolescent (Aulia, 2020).

A suicide is a phenomenon that continues to increase every year, WHO (2016) confirmed that there are approximately 800,000 people die by suicide, and Indonesia was in the fourth position of most suicidal behavior in Asia.

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The Ministry of Health of Republic of Indonesia predicted that in Indonesia there were more than 16,000 suicide cases per year and it kept growing throughout the year (Infodatin, 2019). Suicidal behavior is the deliberate and attempt to kill oneself (Muhith, 2015). Brown & Vinokur (2003) argues that there is connectedness between suicidal ideation and completed suicidal behavior; in other words, suicidal ideation is intent behind suicidal behavior. Suicide ideation is defined as thoughts to kill oneself, either in their mind or expressed to the others (Struart, 2013). Suicidal ideation refers to thoughts for hurting or killing oneself (Valentina, 2016).

In the Beck Scale for Suicidal Ideation proposed by Beck (1979), there are 3 dimensions for suicidal ideation i.e. active suicidal desire which involves attitude of death and life, such as motivation to end their life with specific plan for a suicidal attempt. Passive suicidal desire represents a passive suicidal ideation with desire for death, but without specific plan to make suicide attempt and preparation which involves plan or concrete preparation made by individual to commit suicide using poisons or drugs. According to Klonsky & May (2015, in Karisma, 2021) there are steps to suicidal ideation which is motivated by psychological or physical pain from family or colleagues relationship. Second step is the increase both in passive and active ideation where the relationships with family or friends are stronger than pain and hopelessness, then there are only passive ideas and not turn into active ideas, and vice versa. The third stage is the progression of suicidal ideation into suicide attempts, if at this stage the suicidal ideation grows, the risk of completed suicidal behavior will increase (Karisima, 2021). Handriani (2011, in Khairunisa, 2018) divides the causes of suicidal ideation into 2 factors, among others, the internal factor which occurs from themselves such as depression and hopelessness, and the external factors which arise from environment, such as social support, both from family and environment.

Hopelessness is a psychological condition that becomes source or factor for depression and some other conditions such as suicidal behavior; Hopelessness refers to a cognitive schema system which generally represents negative expectations about future (Beck, 1979). Hopelessness represents a desperateness contributing to lack of energy, loss of hope, and loss of aspirations due to a lack of support in life and causing individuals feel tired and discouraged to deal with problem. It can also occur due to the unexpected situation which can result in frustration and despair in themselves (Melinda, 2017).

In Beck, Weissman, Lester & Trexler (1974) mentioned that hopelessness have three dimensions. First, feelings about the future, the subject of hopelessness have anxiety about their lives in the future. Second, loss of motivation, lack of enthusiasm leading to discouraged feeling and loses optimism in them. Third, future expectations, the anticipation about their future will be dark and difficult. One of the symptoms of hopelessness is an individual only focus on the past and the future instead of the present, and is lack of flexibility in thinking, lack of imagination and capacity to hope, inability to find source of hope, and having suicidal thoughts. (Oktaviana, 2019).

Study on suicidal ideation in adolescents has been carried out in Indonesia as it is made by Pratiwi (2014) which suggests that a psychological pressure is one of the factors influencing suicidal ideation in adolescents. The results of this study were in line with the research made by Aulia in 2020 on psychological factors as the primary risk of suicidal ideation in adolescents. The results also explain that psychological factors are the most dominant factor in adolescent suicide ideation, one of which is hopelessness. This study uses sample of teenagers without specific characteristics and therefore it differs from the previous one. The authors provide sample characteristics on teenagers with suicidal ideation. In consideration of the discussion above, the authors have interest in conducting the same research on the connection—if any—between teenage suicide thoughts and feelings of hopelessness in order to determine whether or not these two phenomena are related.

Problem of Study

Several studies regarding suicidal ideation in adolescents is carried out in Indonesia, such as by Pratiwi (2014) and Aulia (2020). The two researchers concluded that psychological pressure is one factor that affects suicidal ideation in adolescents, especially hopelessness. Research it using a sample of adolescents without any specific characteristics. Therefore to distinguish this study from research previously, the researchers gave certain characteristics to the sample.

The sample is adolescents who are having ideas of suicide. Based on that researchers are interested to research the relationship between hopelessness and suicidal ideation in adolescents.

Method

Research Model

This study uses an approach quantitative with correlational research design to analyze the correlation of hopelessness and suicidal ideation in adolescents. Correlational research is research that analysis produces data in the form of numbers, obtained through measurement and processed with data analysis methods (Anzwar, 2017). The independent variable is hopelessness and dependent variable is suicidal ideation.

Participant

The population in this study was adolescents in Java Island with age ranging from 15 to 20 years old, while the sample in this study were adolescents with suicidal ideation. In determining research population, the author used Lemeshow formula. This formula is used if the population in the study is unknown about the outcome with total minimum samples of 96. Sampling in this study used non-probability sampling techniques covering purposive sampling. The sample of this study were 100 adolescents.

Table 1 Data description of sample

Descriptions	Types	Number	Percentage
Gender	Male	24	24%
	Female	76	76%
Ages	15 Years	7	7%
	16 Years	8	8%
	17 Years	28	28%
	18 Years	27	27%
	19 Years	23	23%
	20 Years	7	7%

Based on the data described by the research above, it can be concluded that the study involved 100 adolescents. There are more female subjects than male subjects. From 100 respondents it is identified that the majority respondent is the age of 17 in the amount of 28 subjects (27%), followed by the age of 18 in the amount of 27 subjects (27%), and the age of 19 in the amount of 23 subjects (23%), the age of 16 in the amount of 8 subjects (8%), and the least is the age of 15 and 20 in the amount of 7 subjects (7%).

Data Collection Tools

The instrument used for measuring hopelessness is adapted from Beck Hopelessness Scale (BHS), with total of 20 items while for determining suicidal ideation the authors use Beck Scale for Suicidal Ideation (BSS) scale, with total of 19 items. The adaptation procedure was carried out based on the stage of back translation according to Beaton (2000) which includes: Translation stage, translating the scale source language (English) into the target language (Indonesian) with help from 2 translators.

Synthesis stage, select the translated item by expert, taken from one of the lecturers at the Faculty of Psychology, State University of Malang. Back-translation stage, the translation concluded by experts will be converted into the source language (English) with assistance from a translator. The fourth stage is expert judgment which aims at reviewing all translation results with the support from two lecturers at Faculty of Psychology, State University of Malang, and the final stage is pretesting item, distributing the scale minimum for 30 people to test the feasibility of the scale.The validity test used in this study is content validity as carried out by testing the feasibility of the test content with expert judgment and the value is calculated using Aiken's V, to know the differentiator level of items using item differentiator test

through comparisons between r-counts and r-tables. Meanwhile, for obtaining item reliability, the authors used Alpha Cronbach formula.

Beck Hopelessness Scale

This scale was adapted from Beck Hopelessness Scale (BHS) develop by Beck, Weissman, Lester & Trexler (1974). This aspect measures three dimentions: *feelings about the future, loss of motivation,* and *future* expectations**.** Based on the reliability test results, a BHS scale was obtained with an alpha Cronbach coefficient of 0.867.

Beck Scale for Suicidal Ideation

This scale was adapted from Beck Scale for Suicidal Ideation (BSS) by Beck (1979*),* this aspect This aspect measures three dimentions: *active suicidal ideation, passive suicidal desire,* and *preparation.* Based on the reliability test results, BSS scale with *alpha Cronbach* coefficient of 0.895.

Data Analysis

In this study, the data analysis used was descriptive and correlational analysis. Descriptive analysis found minimum value scores, maximum values, moderate values, and standard deviations, which were further divided into three categories: low, medium, and high. Next, a normality test is carried out to determine the distribution of data on normal or not distributed variables, a linearity test to determine the relationship between the variables studied, and a correlation test using *Pearson product-moment.*

Results

Descriptive Analysis

Table 2. Hopelessness categorization

Category	Frequency	Percentage
Low	20	20%
Moderate	42	42%
High	38	38%
Total	100	100%

According to the table 2, the subject with most hopelessness lies in moderate category in the amount of 42 adolescents with a percentage of 42%. Meanwhile, the research subject with least hopelessness lies in low category where the in result of categorization subject number in low category is 20 adolescents or 20%

Table 3. Suicidal ideation categorization

Category	Frequency	Percentage
Low	20	20%
Moderate	46	46%
High	34	34%
Total	100	100%

Based on the table 3, it is found that the subject with most suicidal ideation lies in moderate category in the amount of 46 adolescents with a percentage of 46%. Meanwhile, the subject with least suicidal ideation lies in low category where in the categorization result subject number in low category is 20 adolescents or 20%.

Correlational Analysis.

The correlation analysis process will begin by testing the normality and linearity of data. Kolmogorov-Smirnov is used in this study's normality test, which is supported by SPSS. Since the significance value is larger than 0.05 and is equal to 0,200, it can be said that the data is regularly distributed. See the table 4.

Table 4. Normality test result

p	Sig.	Conclusion
0.200	>0.05	Normal

This study's linearity test makes use of SPSS to test for linearity. There is a linear association between hopelessness and suicidal thoughts, according to the results of the Linearity Test, where the Significance value was 0,509, higher than 0,05. see the table 5.

Table 5. Linearity test result

p	Sig.	Conclusion
0.509	>0.05	Linear

The hypothesis in this study is that there is a relationship between hopelessness and suicidal ideation in adolescents. Test the hypothesis in this study using pearson's product moment correlation with the help of SPSS, the results of the hypothesis test can be seen in the table 5:

Table 5. Hypothesis testing result

r	Sig.	Conclusion
0.749	0.001	a significant positive correlation

According to the findings of the correlation test, there is a positive strong correlation between hopelessness and suicidal ideation in adolescents with r = 0.749 and p = 0.001 as the results. The research concludes that there is the higher the hopelessness, the higher the suicidal ideation, and conversely the lower the hopelessness, the lower the suicidal ideation.

Table 6. Correlation dimensions of hopelessness and suicidal ideation

	hopelessness		
	feelings about the future	lost of motivation	future expectation
Suicidal ideation	0,550 (p = 0.001)	0,705 (p = 0.001)	0,635 (p = 0.001)

Based on table 6 is known that the first, the correlation coefficient of the dimensions of feelings about the future and suicidal ideation is 0.550 (p=0.001). These results indicate that there is a significant positive relationship between the dimensions of feelings about the future and suicidal ideation. The second, the correlation coefficient of the dimensions of lost of motivation and suicidal ideation is 0.705 (p=0.001), which means that there is a significant positive relationship between the dimensions of lost of motivation and suicidal ideation. The third, the correlation coefficient of the dimensions of future expectations and suicidal ideation is 0.635 (p=0.001). These results indicate that there is a significant positive relationship between the dimensions of future expectations and suicide ideation.

As for the correlation strength between dimension of hopelessness and suicidal ideation, it is known that lost of motivation and hope for the future have a strong positive correlation with suicidal ideation, while feelings about the future have a moderate positive correlation with suicidal ideation. The dimension of lost of motivation is the dimension that has the strongest relationship with suicidal ideation in adolescents.

Discussion and Conclusion

The purpose of this investigation is to ascertain how adolescent suicide ideation and hopelessness are related. Based on overview of research subjects, the most of respondent in this study are female adolescents by 76%, by majority of respondents at the age of 17 with 28 respondents. The result of decriptive analysis using categorization shows the majority of respondents in this study are at moderate hopelessness. The adolescent stage is a vulnerable stage in emotional and behavioral development since they are in a transitional period from childhood to adulthood, and therefore at this stage the adolescents tend to suffer from various problems which are the main cause of hopelessness or

desperate (Azari, 2020). Hopelessness can occur in adolescents due to lack of proper understanding about various events they have experienced. The adolescents with difficult situations tend to perceive that as a problem that can affect their future life (Kusumayanti, 2020).

The result obtained from descriptive analysis test in suicidal ideation variable shows that the majority of respondent in this study also have suicidal ideation at moderate category. Suicidal ideation in adolescents may be developed due to lack of support from family and no open communication both with family or friends (Bertera, 2007, in Aulia 2020). The lack of attention from community may lead adolescents having suicidal ideation because of their adolescents. An individual starts to develop its self-identity since during their adolescents the pressure is getting stronger. The adolescents considers that having a group is necessary and therefore they need someone closed such as friends (Aulia, 2020).

According to the study's findings, adolescent suicidal ideation and hopelessness are positively correlated, with a correlation coefficient of 0.749 and a significance value of 0.001 to 0.05. This means that independent variables related to hopelessness have a significant impact on variables related to suicidal ideation. The result of positive correlation between hopelessness and suicidal ideation is in line with Beck's argument (1974) that hopelessness is the key factor contributed to suicidal behavior, attempts and ideation in various populations, where hopelessness has a significant correlation with suicidal ideation. This study has the same results with the research made by Kusumayanti (2020) that hopelessness has a positive relationship with the Suicidal Ideation. Research conducted by Huen, IP, Ho & Yip (2015) said that the higher the hope, the lower the suicidal ideation will be, while the higher the hopelessness, the higher the suicidal ideation will be.

Based on the results of correlation test between hopelessness dimension with suicidal ideation, it is found that lost of motivation is a dimension with significant correlation with suicidal ideation in adolescents. Motivation for living is crucial for adolescents since they will be a driving force to stimulate, direct or maintain behavior at specific direction (Yuwono, 2005). Loss of motivation in adolescents can be affected by several factors. In general, they may arise from internal such as emotion, mood, and belief. Those factors also may arise from external such as human relationship (Astinawati, 2019). Individuals with loss of motivation in life tend to focus on discouraged and unoptimistic attitude, and choose to give up and do nothing to reach their goal (Beck,1974).

Based on the findings of this study, the authors draw the conclusion that there is a positive relationship between hopelessness and suicidal ideation in adolescents. A positive relationship means that adolescents will have more suicidal ideation when their level of hopelessness is higher; conversely, when their level of hopelessness is lower. The result of data categorization demonstrated that hopelessness and suicidal ideation category in adolescents tend to moderate.

Recommendations

The authors realize that this study is far from perfect, and therefore the authors suggest for further researchers, writer hoped that they can conduct more detailed research, for example examining the dimensions of suicidal ideation more specifically. The authors also suggest for the adolescents with suicidal ideation to grow their motivation to reduce hopelessness and desire for suicide.

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