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RESEARCH ARTICLE

A CORRELATION STUDY BETWEEN PHYSICIANS PROBLEM SOLVING STYLES AND PERSONALITY TYPES

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ABSTRACT

In our lives, we are constantly faced with difficult and difficult problems in decision-making. In order to overcome the problem effectively, we need to make the right decision. Many factors affect decision-making. Researchers have determined that personality differences or personality types can affect these. Depending on the personality types, the time to decide and the approach to it differ. When making decisions, the personality types that are necessary when determining the goals and objectives of a person's actions and activities and making a choice are affected. There are studies that have studied decision-making styles at the level of leaders, but they have rarely been studied in relation to their individual characteristics. The reason for conducting this study on doctors is that they interact with people every hour and minute and work for the most precious thing, which is health. They also have a very stressful job and face a lot of problems. One wrong decision or one wrong step can cause great harm. Therefore, it was considered necessary to determine the characteristics of problem-solving and personality types of these professionals. A total of 300 doctors working in Mongolian state hospitals were randomly selected and the results were presented. The results of the study showed the relationship between problem-solving characteristics and personality types. In terms of viewing, the characteristics of vigilance, critical external environment (0.289**) and receptive external environment. There was an inverse correlation with the (-0.289**).

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INTRODUCTION

In psychology, problem solving refers to taking steps with more complex logic to achieve a goal from a given situation. Problems arise when a person overcomes some obstacle to his desired goal. J. Thomas and D. Zurilla (1988) defined problem solving as a cognitive behavioral process and decision-making during conflict situations that occur in everyday human activities. It is an evolutionary driver for living organisms and is an important skill for solving various problems. Problem solving characterizes higher-level cognitive processes and intellectual functions. There are two types: mathematical problem solving or personal problem solving. The problem of solving everyday life problems depends on the motivational and thematic components of the individual. One such component is the value of the "real world" problem, which can help solve the problem.

Conflict theory for problem-solving decisions: They emphasized that stress during decision-making directly affects the decision-making process, which is characterized by increased stress due to the potential risks that may arise after a decision is made. This can lead to people making cautious or inappropriate decisions. Mild stress may lead to more cautious decisions. The ways in which people cope with the stress of making decisions are reflected in different decision-making patterns. The different patterns are generally divided into two main categories: vigilant and inattentive. Vigilant decision-makers

tend to be more adaptable, while inattentive decision-makers tend to be the opposite. Individuals who are cautious when making decisions

evaluate alternative solutions, generate alternatives, and choose the one that best suits the situation. It has been suggested that this is related to high values (Philips, Pazienza, & Ferrin, 1984). The model proposed by Janis and Mann has been widely supported by researchers working in the field of decision-making.

Decision making in psychology: In psychology, decision-making is a cognitive process. Decision-making is the process of choosing the most appropriate course of action from among many alternatives. Decision-making is an essential part of a manager's daily work. Individuals approach various problems in business practice in a variety of ways. The choice of options depends on many factors, including an individual's knowledge, experience, creativity, and intuitive approach. These included: fully recognizing the importance of the decision being made, being able to generate and evaluate decision alternatives well, identifying opportunities to overcome obstacles that may arise because of the decision, and using an appropriate control system. Not all decision-making processes are influenced by conscious or multifaceted thoughts. We do not make decisions based on careful, deliberate thoughts in the everyday activities we do. This process is called automated decision-making. However, if the outcome of the decision is important and requires conscious processing and attention, it is called non-automated decision-making. Boulgarides & Moonsong conducted a study in

1985, which found that managers' belief systems, beliefs, unconscious biases, and information classification are important factors in decision-making. Decision-making styles are influenced by country, region, type of organization, and the age and education of the leader. Leadership styles and decision-making also differ across cultures (Powell G., 2018). Several factors influence decision-making. To understand what decisions are made, it is important to understand what factors influence them. These included: experience, cognitive reflection, age, personality types, and personal beliefs. Experience has a significant impact on future decisions. Juliusson, Karlsson and Garling (2010) have shown that past decisions influence future decisions. People are more likely to make the same decisions in the future if they have had positive outcomes in the past. On the other hand, people are less likely to repeat past mistakes (Erdenechuluun, 2016). They don't like to repeat their mistakes. Cognitive biases also affect decision-making in a small number of cases. They are a combination of memory errors, faulty inferences, faulty logic, and observation-based thinking patterns (Batbold, 2010). They cause people to rely too much on their prior knowledge and preconceived beliefs, leading to a lack of clarity about the big picture and inaccurate information transfer. This can sometimes lead to poor decision-making.

Decision-making is influenced by the perception of increased commitment or sunk costs. People are more likely to give up their time, money, and influence over problems as they become more responsible. The more they perceive their responsibilities to be, the more likely they are to make risky decisions. Some individual characteristics also play a role. Researchers have suggested that age, social status, cognitive abilities, and personality traits play a role (Bruin, Parker, & Fischeff, Individual differences in adult decision-making competence, 2007). As people age, they become more independent and skilled in decision-making. Adults also make fewer quality choices than younger children (Reed, Mikels, & Simon, 2008). By adhering to specific principles in the decision-making process, the implementation of the results of individual decisions, as well as management, improves. The nature of a physician's problem-solving skills is influenced by the level of stress at work. This problem is common among physicians who deal with difficult patients, such as psychiatrists, geriatric nurses, oncologists, emergency physicians, and surgeons. "On defensive decision-making: how doctors make decisions for their patients." The study involved 80 physicians, divided into two groups: the first group was given only their own decisions, while the second group was given the patient's decisions. As a result, physicians choose more traditional methods of treatment for their patients. They expected that patients would choose more risky treatments, but they chose traditional methods. As for why, 93% of physicians said it was because of legal consequences. "Clinical decision-making: physicians' preferences and experiences". The study included 1,050 physicians in the United States. 780 (75%) physicians shared their decisions with their patients. 142 (14%) physicians prioritized the provision of care, while 118 (11%) physicians prioritized the client's best interests. Measures to improve decision-making include ensuring that patients have sufficient time during the consultation to clearly address concerns and that patients' health information is accessible.

In addition to making decisions on daily tasks, the following decisions are made as required by law:

- The medical professional shall explain the diagnosis of the client's illness and the nature, causes, diagnosis, treatment methods, their results, risks, complications, the actual capabilities of the client and the organization, other possible options, and other necessary and accurate information to the client and his/her legal representative (parent, guardian, or custodian) in simple, understandable terms, so that they can make a decision.
- A medical professional may make decisions about health care services without the consent of the client or his/her family in the following cases:

- If a disagreement arises between doctors during the decision-making process regarding the care provided to a client, the treating doctor will make the final decision. In the event of a consultation between doctors, the decision of the consultation will be followed.

For a physician, the only factor in making treatment decisions is his or her years of knowledge, clinical training, and the best treatment for the patient (Zhang Y, 2012). The results of a study on physician decision-making indicate that the following four factors are the most important.

- Physicians say compensation and income decisions have a significant impact on job responsibilities. More than 68% of physicians say compensation and income decisions have a significant impact on job responsibilities.
- Pressure from hospital management and other third parties - Doctors believe that they are unable to adequately communicate and make their views and desires understood by management.
- Legal regulations. Since doctors are responsible for the most serious work, namely the lives of people, they also have many responsibilities imposed on them by law.
- The patient will influence the doctor's decision-making.

Theories and concepts that explain personality types

A person is a person who develops into a person by entering social relations and forming the subjective characteristics of that society. In other words, a person is a conscious person who actively and creatively participates in social activities. The concept of "person" in its most general sense refers to the social characteristics of people's behavior, as well as the common and unique characteristics of the psyche towards other people and society. The special characteristics and behavior of people who have reached adulthood are formed and formed by heredity and the environment, and this behavior changes depending on the circumstances of the time.

In his work "Psychological Types", Carl Jung considered two parallel types of mental attitudes - extraversion and introversion - and four types of functions - sensing, intuition, thinking and feeling, one of which dominates and influences consciousness (Peter Geyer, 2014). He proposed a theory that can determine a person's behavior.

A theory that can be defined. There are two tendencies in a person: introvert and extrovert, which differ in a specific attitude towards objects. K. Jung spoke about the conscious and unconscious psyche, and the dominant tendency determines the consciousness, while the repressed tendency determines the general attitude of the unconscious psyche and maintains the mental balance of the person.

Myers & Briggs developed a theory of sixteen personality types, based on the combination of perceiving and judging functions and the dominance of either perceiving or judging functions in that combination, and introduced a fourth factor, which is related to the way people interact with the outside world.

Table 1. Comparison of K. Jung and Myers Briggs Personality Types

Jung's Personality types	The 4 Letters of Myers and Briggs Personality Types	
ES	ESTP	ESFP
EN	ENTP	ENFP
ET	ESTJ	ENTJ
EF	ESFJ	ENFJ
IS	ISTJ	ISFJ
IN	INTJ	INFJ
IT	INTP	ISTP
IF	INFP	ISFP

Personality is a relatively stable characteristic of an individual, reflecting the person's attitude towards their profession, environment, and people. Another common characteristic is the ability to be independent, purposeful, orderly, and determined, with perseverance, and goal-oriented, regardless of circumstances. Three factors influence the individual working in any organization. Personal factors are the mind, body, ethnicity, family, and age, while psychological factors are the intuition, perception, opinions, and attitudes that influence decision-making and actions. How an organization allocates its resources, management practices, and motivation, rewards, salaries, job responsibilities, and organizational structure all contribute to the organizational performance. Management style, motivation, rewards, salaries, job responsibilities, and organizational structure are all factors that influence individuals from the organization.

RESEARCH SAMPLE AND METHODS

Research sample: As of 2024, there are a total of 15,973 general practitioners in Mongolia, of which more than 7,400 are working in Ulaanbaatar. The study randomly selected 300 general practitioners from 7 hospitals across the country. A total of 10 different specialties were involved: ophthalmology, cardiology, otolaryngology, surgery, nephrology, resuscitation, internal medicine, infectious diseases, trauma, and gynecology. The same number of physicians from each specialty, or 30, participated in the study. In terms of gender, 76% of the study participants were female and 26% were male. In terms of age, 12% were 25-29 years old, 26% were 30-34 years old, 22% were 35-39 years old, 32% were 40-44 years old, 5% were 45-59 years old, and 3% were 50-54 years old. In terms of years of experience, 26% of the study participants were 0-5 years, 35% had 6-10 years, and 36% had more than 11 years. The educational level of the doctors was 56%, with a bachelor's degree, 29% with a master's degree, and 5% with a doctorate. 84% of the participants were married and 16% were single. Since problem solving is a cognitive process, 300 doctors were first given an IQ test. The results showed that 5% had a very high IQ, 25% had a high IQ, 37% had a high IQ, 29% had a low IQ, and 1% had a low IQ. In the analysis, 3 doctors with low IQ were excluded, and 297 physicians were further studied.

The control group included 105 employees of the private sector "MCS-Energy Network" LLC. 70% of the respondents were electrical engineers, and the remaining 20% were drivers, accountants, and administrative human resources professionals. 57% of the respondents in the control group were male and 43% were female employees. The control group was given an IQ test before receiving the main survey questions. As a result, 2% showed very high performance, 10.3% high performance, 30.7% above average performance, and 57% above average performance.

RESEARCH METHODS

- The IQ test taken beforehand consists of 40 questions, each question carries one point. The results are divided into 6 levels according to age group. These are: very high, high, above average, below average, low, and very low (Даваажав.Б & Нямаа.Ж, 2003).
- 1982 Leon Mann "The Flinders Decision Making Questionnaire". This questionnaire has a total of 31

questions and 3 answers and identifies 6 decision-making styles. These are: alert, hyper-alert, avoidant, delegating, deferring, and rational or rational.

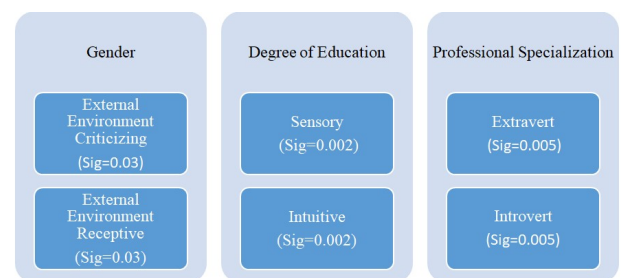
- In 1944, Briggs and Myers published the "Myers-Briggs Personality Type Indicator" (Briggs & Myers, 1962). In 1962, the first version of the MBTI was published. This test is designed to determine personality types, i.e., decision-making, attitudes, and psychological differences. The test used in the study consists of 20 questions, each with two options.

RESEARCH RESULTS AND DISCUSSION

The reliability of the test for detecting problem-solving characteristics can be seen in the table below, and in general, the reliability coefficient indicates that this method is effective enough to be used.

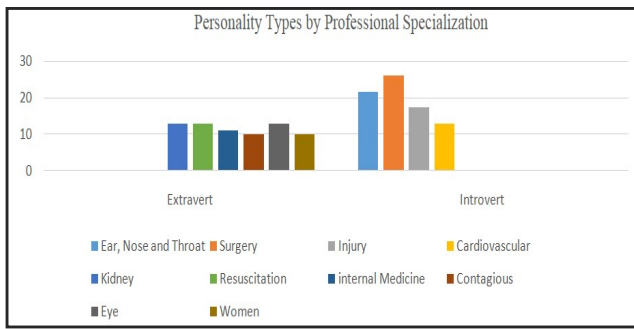
Table 2. Test Reliability Style Cronbach's Alpha

Types	Cronbach's alpha
1.Rationalization (Хэт сэрэмжтэй)	0.530
2.Hypervigilance (Оновчтой буюу ухаалаг)	0.729
3.Vigilance (Сонор сэрэмжтэй)	0.769
4.Defensive Avoidance (Зайлхийгч)	0.710
5.Buck Passing (Хариуцлагыг бусдад тохогч)	0.510
6.Procrastination (Хойш тавигч)	0.510
Decision-Making Style Inventory	0.784



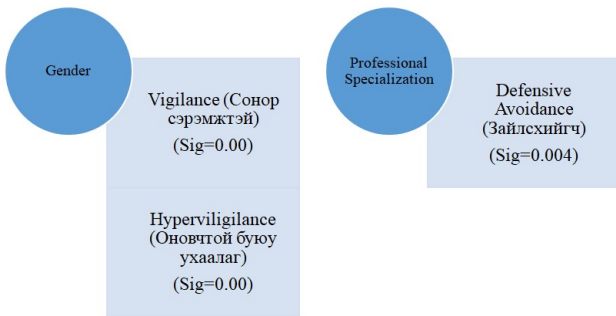
Picture 1. The Difference Between Personality Types and Independent Variables

When two independent analyses were conducted to determine whether the personality types of the study participants differed by gender, the significance of the differences in the external environment criticizing and the external environment receptive types were less than 0.05, or 0.03, indicating a difference. When K Independent analyses were conducted for the level of education, the significance of the differences in the sensory and intuitive personality types was 0.002. The analysis was also conducted within a narrow professional context, and differences were found between extrovert and introvert types. Female doctors were more likely than male doctors to be critical of the external environment, at 56%, compared to 12% of male doctors. Female doctors are considered to be more organized and planful in their approach to things. People with bachelor's degrees had 53% of the sensory types, which are a manifestation of personality type, compared to 15% of those with master's degrees. However, people with doctorates had equal levels of sensory and intuitive types. This shows that most respondents tend to focus more on what can be experienced through the five senses, value tried-and-true methods and principles and rely on experience-based knowledge to ensure their own and others' health.



Graphic 1. Personality Types by Professional Specialization

Introverted and extraverted personality types differ depending on the specialty. Specifically, ear, nose, and throat (ENT) doctors account for 21.7%, surgeons for 26.1%, trauma surgeons for 17.4%, and cardiovascular specialists for 13% of introverted personality types. Conversely, most majority of extraverted types are comprised of nephrologists (13%), intensive care doctors (13%), internal medicine specialists (11%), infectious disease specialists (10%), ophthalmologists (13%), and gynecologists (10%), respectively.



Picture 2. Differences in Problem-Solving Characteristics, Gender, and Professional Specialization

When performing a two-independent samples analysis on whether problem-solving characteristics differ by gender, the results showed that 'vigilant' and 'rational' (optimal) problem-solving characteristics were different. For professional specialization, a K-independent samples analysis showed a difference in the defensive avoidance style. Regarding gender, 66.7% of men have a rational problem-solving style, while 80% of women have a vigilant problem-solving style. Looking at doctors with defensive avoidance problem-solving style within their specialties, surgeons account for 28.6%, cardiovascular specialists for 57.1%, and intensive care specialists for 14.3%.

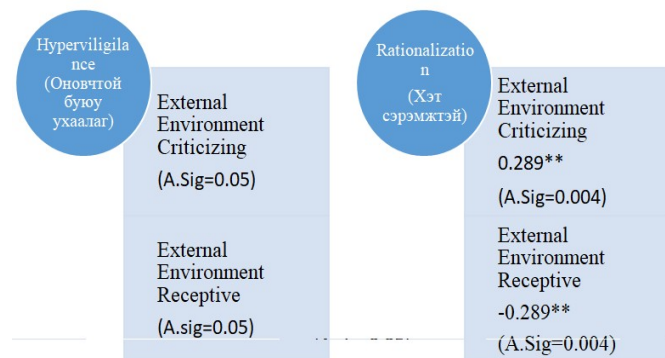
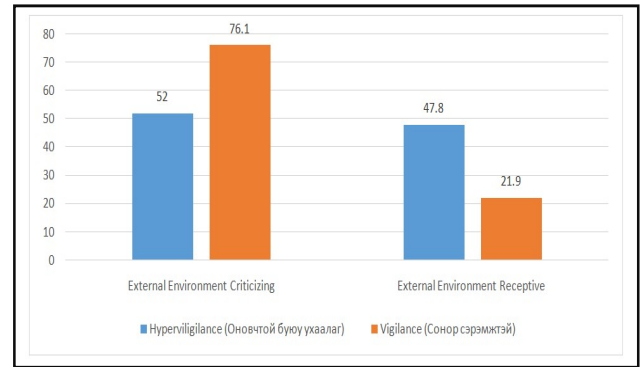


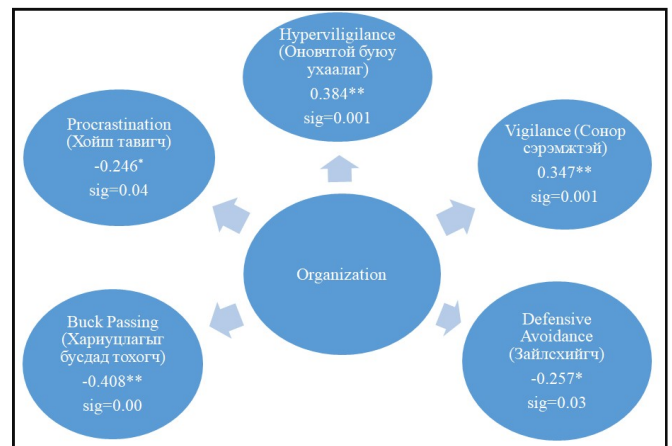
Figure 3. Relationship Between Problem-Solving Characteristics and Personality Types

When examining the relationship between personality types and problem-solving characteristics, it was found that hypervigilance and vigilance problem-solving styles are correlated with the manifestation of personality types involving critiquing and perceiving the external environment. From this, it can be concluded that individuals with hypervigilance and vigilance problem-solving styles approach the external environment more critically, handle matters in an organized and planned manner, and do not accept situations at face value.

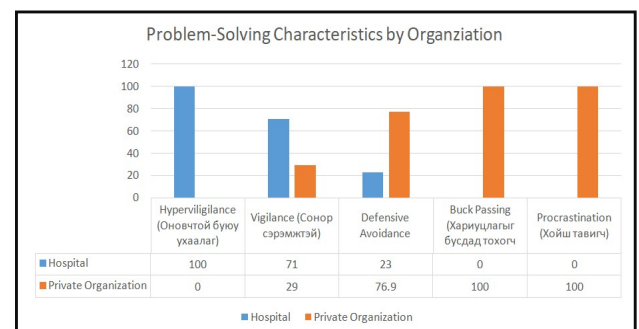


Graphic 4. Correlation Between Problem-Solving Characteristics and Personality Types

52% of people with a rational problem-solving style and 76.1% of people with a vigilance problem-solving style have a personality type that critiques the external environment. On the other hand, among personality types that perceive (accept) the external environment, 47.8% have hypervigilance and 21.9% have a vigilance problem-solving style.



Picture 4. Correlation Between Problem-Solving Characteristics and Organization



Graphic 5. Problem-Solving Characteristics by Organization

As a control group, a survey was conducted using this questionnaire among 105 employees, representing 80% of the total staff of 'MCS-Erchimt Suljee' LLC, a private sector organization. Within the framework of the two organizations, Pearson correlation was used to examine the relationship between personality types and problem-solving characteristics, and a Student's T-test was conducted to determine if significant differences existed. The results showed that while personality types were not significantly correlated with the organization, problem-solving characteristics, on the contrary, were dependent on it. The correlations between the organization and problem-solving styles were hypervigilance (0.384), vigilance (0.347**), defensive avoidance (-0.257*), buck-passing (-0.408**), and procrastinating (-0.246*). From the data above, it can be concluded that people's problem-solving characteristics differ depending on the organization and the professional specialization.

For hospital staff, the rational problem-solving style was 100%, vigilance 79%, and defensive avoidant 23%, while buck-passing (dependent) and procrastinating styles were not observed. In contrast, for private sector employees, the vigilance style was 29%, defensive avoidance 76.9%, and buck-passing and procrastinating styles were 100%, while the rational style was absent altogether. From the above, it can be concluded that the lower-stress and easier working conditions of private sector employees lead to a dominance of collaborative problem-solving within small teams. However, for doctors, as they generally perform their duties independently in a highly responsible profession, hypervigilance and vigilance problem-solving characteristics are more prevalent.

CONCLUSION

A total of 300 doctors participated in the study, and data from 297 eligible doctors were used for further analysis. The results of this study show that personality types and problem-solving characteristics differ depending on gender and specialization profession. Examining the relationship between problem-solving characteristics and personality types, the vigilance style was found to have a positive correlation (0.289) with the 'critiquing the external environment' trait and an inverse (negative) correlation (-0.289**) with the 'perceiving the external environment' trait. ** Furthermore, chi-square analysis revealed that individuals with a hypervigilance problem-solving style are correlated with both 'critiquing' (A.Sig=0.05) and perceiving (A.Sig=0.05) the external environment.

The critiquing the external environment trait—characterized by an organized, planned, and methodical approach—was more prevalent among doctors; this relates to their vigilance problem-solving style, which relies on precise planning, theory, and experience. Compared to the control group, significant differences in problem-solving characteristics were observed: while doctors tend to approach problems rationally and vigilantly, employees in regular organizations tend to solve problems by passing responsibility (buck-passing), procrastinating, or avoiding them. From this, it can be concluded that professional characteristics and workplace conditions influence problem-solving styles.

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