

A Comparative Analysis of Introvert and Extrovert Dental Students toward Clinical Performance

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ABSTRACT

Aim: This study aims to identify introvert and extrovert personality types among level-6 dental students in the College of Dentistry, Jazan University, Jazan, Saudi Arabia, and analyze their clinical performance.

Materials and methods: In this causal-comparative research, 72 level-6 dental students (29 males and 43 females) of the College of Dentistry of Jazan University for the school year 2023–2024 were chosen to be the respondents. Myers-Briggs type indicator (MBTI), a personality test designed to differentiate introversion and extroversion, was used. Two independent variables were compared in accordance with the average grades in their clinical performance.

Results: The average grade of introvert dental students was 83.54 ± 7.57 , with a median of 85.06, and that of extrovert dental students was 84.03 ± 7.01 , with a median of 86.9. The *p*-value was calculated to be 0.917, and a significance level of 0.05 was used for comparison.

Conclusion: Clinical performance was not significantly different between introvert and extrovert dental students.

Clinical significance: Awareness of personality differences of members of a dental team is vital to help translate every weakness into a workable strength so that the treatment plan for each patient will be delivered with utmost quality and excellence.

Keywords: Clinical performance, Introvert and extrovert, Personality type.

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INTRODUCTION

Every individual possesses a unique pattern of feelings, thoughts, attitudes, and behavior, which shape their personality. These aspects affect how an individual deals with daily functions and could become either a strength or a limitation.^{1–3} The personality spectrum varies in psychological studies, such as psychoanalysis, psychodynamics, social-cognitive, cognitive-affective, and others. One theory on analytical psychology is Carl Jung's attitude and function type of personalities: Introversion and Extroversion.^{4,5}

An individual's personality and behavior can be categorized using the Myers-Briggs personality type indicator (MBTI), a self-report tool. It was a questionnaire created by Isabel Myers and her mother Katherine Briggs to support Carl Jung's idea of personality types.^{6,7} Myers-Briggs personality type indicator is an accurate psychological test in use today. According to test-retest reliability ratings, and the test's official website, the examination is 90% accurate.^{6,7} It consists of 50 questions that will reveal if the respondent falls either in the introvert category or extroversion.

The two opposing attitude types—introvert and extrovert—are determined by how a person views other individuals and other external objects, according to Jung G. The introvert is determined to withhold strength, as if to ensure that the thing cannot have any power over the person whereas extrovert shows participation, creating an active interaction to people.^{4,8} The former thrives in solitude, feels drained in crowds, prefers participating in less stimulating activities, is creative, and renders things best in alone time.^{9,10} The extrovert seeks outside self-stimulation, enjoys group work, prefers to solve problems with others, and verbalizes ideas.

Falling into these personality types can affect how people live productively. Sayankar KV stated that everyone has their own strengths and limitations. An individual's personality determines

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how they perform their tasks.^{11,12} Engaging in different activities and circumstances that require people to accomplish their goals or attend to their responsibilities may become a struggle because of the personality that they possess.¹³ This challenge applies to all people, including students.

In dental colleges, students acquire theoretical knowledge through classroom and laboratory lectures in preparation for their clinical exposure in which their skills in various dental treatments are being enhanced. The clinical performance of every dental student defines the quality of their work on how they deal with

patient’s needs. They should provide excellent care by focusing on their work in quietness as well as by setting a treatment plan and collaborating with the dental team. Given the opposing strengths and limitations of introvert and extrovert personality types, dental students must cope up positively and maximize their potential not only in clinical performance but also in delivering the best oral care for the welfare of their patients.

To fully mold and train the students, professors should be aware of the students’ personalities so that they can help and support the students on how they combat their personality limitations, which gives them stress and anxiety in the clinical area.^{14–16} According to Tworek, awareness to own behavior helps a lot in bringing change because positive and negative traits are workable to bring out the best of each individual of the two personality types.¹⁷

According to the authors’ knowledge, there is currently no research evidence in the scientific literature regarding the difference between personality types toward clinical performance. This study aims to identify introvert and extrovert personality types among Level-6 students at the College of Dentistry, Jazan University, Jazan, Saudi Arabia during the 2023–2024 academic year. This work will determine if clinical performance significantly differs between the two personality types.

MATERIALS AND METHODS

Study Design and Ethical Approval

The study adopted a quantitative nonexperimental design to classify the dental students into two opposing personality types.⁴ The respondents of this causal–comparative research were the 72 level-6 dental students (29 males and 43 females) of the College of Dentistry in Jazan University during the school year 2023–2024. This research design helps determine the causes of differences in clinical performance among or between different groups of people. Ethical consent was gained from the Jazan University Standing Committee for Scientific Research with Reference No.: REC-45/04/837.

Questionnaire Design and Contents

The Myers–Briggs Type Indicator that was used to categorize the respondents comes with a questionnaire and a corresponding scoring sheet (Table 1). It consists of 50 jumbled questions that evaluate preference toward the following four different dichotomies: Introversion–extroversion, sensing–intuition, thinking–feeling, and judging–perceiving.^{3,18} Moreover, the author of MBTI intentionally mixed up the questions pertaining to the four dichotomies to thwart respondent manipulation and anticipation.⁶ There are two answers to each question, A and B, and each has a corresponding score that matches.

Data Collection

A total of 72 level-6 dental students were chosen to be the respondents of this study because they already completed and obtained their final grades in all the clinical courses such as endodontics, restorative, oral surgery, periodontics, prosthodontics, and pedodontics.

Prior to in person distribution of questionnaires, the researchers made sure that every respondent understood the purpose and extent of the study. A written informed consent was then accomplished by the respondents. A total of 72 students received questionnaires within the allotted 2-month period, which is sufficient time for them to consider their own preferences and points of view.

Table 1: Myers–Briggs type indicator scoring sheet¹⁸

| Question and choice | Introversion/extroversion | | Sensing–intuition | | Thinking–feeling | | Judging–perceiving | | |
|---------------------|---------------------------|---------------------|-------------------|---------------------|------------------|---------------------|--------------------|---------------------|--------------|
| | Score | Question and choice | Score | Question and choice | Score | Question and choice | Score | Question and choice | |
| 3A | 2 | 3B | 2 | 2A | 2 | 4B | 1 | 1A | 2 |
| 6A | 2 | 6B | 1 | 5B | 1 | 14B | 2 | 7A | 1 |
| 9A | 2 | 9B | 1 | 10A | 1 | 22B | 2 | 8A | 1 |
| 13A | 1 | 13B | 2 | 12A | 1 | 30A | 2 | 11A | 2 |
| 16A | 2 | 16B | 2 | 15B | 1 | 32A | 1 | 17A | 2 |
| 21A | 2 | 21B | 2 | 20A | 2 | 33B | 2 | 18A | 2 |
| 24A | 1 | 24B | 1 | 23B | 2 | 37A | 1 | 19A | 1 |
| 26A | 1 | 26B | 0 | 28B | 2 | 39A | 1 | 25A | 1 |
| 29B | 2 | 29A | 2 | 31A | 2 | 40B | 2 | 25C | 1 |
| 36B | 2 | 36A | 1 | 35A | 2 | 44A | 1 | 27A | 2 |
| 43B | 1 | 43A | 1 | 38B | 2 | 46A | 2 | 34A | 2 |
| | | | | 42A | 1 | 47B | 2 | 41A | 2 |
| | | | | 45B | 2 | 49A | 2 | 49B | 1 |
| | | | | 48A | 1 | 50A | 2 | 50B | 0 |
| Total score: | | | Total score: | | Total score: | | Total score: | | Total score: |

E, extroversion; F, feeling; I, introversion; J, judging; N, intuition; P, perceiving; S, sensing; T, thinking

Table 2: Criteria reference scale for clinical performance

| Grade range | GPA (out of 5) | Values | Values in symbols |
|----------------|----------------|---------------|-------------------|
| 95–100 | 5.0 | Exceptional | A+ |
| From 90 to <95 | 4.75 | Excellent | A |
| From 85 to <90 | 4.5 | Superior | B+ |
| From 80 to <85 | 4.0 | Very good | B |
| From 75 to <80 | 3.5 | Above average | C+ |
| From 70 to <75 | 3.0 | Good | C |
| From 65 to <70 | 2.5 | Pass – high | D+ |
| From 60 to <65 | 2.0 | Pass | D |
| <60 | 1.0 | Fail | F |

GPA, grade point average

The researchers accurately recorded all the responses and the corresponding score of each respondent from the MBTI questionnaire to its scoring sheet. Scores are then summed up for each category in four dichotomies respectively. Subsequently, total scores between the two categories in each dichotomy were compared, and the personality type of the respondent was the category with the highest point value. For example, if the respondent’s total score in each category in four dichotomies were 2-E vs 13-I; 10-S vs 7-N; 13-T vs 8-F; and 15-J vs 2-P, the personality type is introvert specifically introversion, sensing, thinking, judging (ISTJ).

Clinical Performance of Respondents

After collecting the scores and identifying the personality type, a copy of the students’ final grades or marks on their previous clinical courses were obtained from their respective Course Coordinators. The total grade of each introvert and extrovert student in their clinical performance in six courses were averaged. Data were compared and analyzed. The personality type, namely, introvert and extrovert, was the independent variable, and the performance was the dependent variable. Table 2 shows the criteria reference scale used by College of Dentistry, Jazan University.¹⁹

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.0 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistical analysis was performed to assess the mean± standard deviation, median, mode, and variance for the two personality types. The normality of data was assessed using Shapiro–Wilkinson test, while Levene’s test was used for homogeneity data testing. The level of significance was set at $p < 0.05$.

The differences between the two groups were assessed using the Mann–Whitney *U*-test because the dental students’ clinical performance ratings or the dependent variable were not normally distributed but continuous.

RESULTS

Personality Type Category

A total of 68 level-6 dental students completed and submitted their questionnaires, yielding a 94% response rate. Based on the MBTI, the respondents were classified into 16 distinct personality types but the major classifications are Introversion and Extroversion. The following are the dissimilar personality based on MBTI: Introversion, sensing, thinking, judging; introversion, sensing, feeling, judging

Table 3: Result of MBTI

| Personality types | Quantity | | | Personality types | Quantity | | |
|-------------------|--------------|--------|-------|-------------------|--------------|--------|-------|
| | Male | Female | Total | | Male | Female | Total |
| | Introversion | | | | Extroversion | | |
| ISTJ | 8 | 9 | 17 | ESTJ | 5 | 11 | 16 |
| ISFJ | 0 | 5 | 5 | ESFJ | 1 | 1 | 2 |
| INFJ | 0 | 0 | 0 | ENFJ | 2 | 0 | 2 |
| INTJ | 1 | 0 | 1 | ENTJ | 2 | 1 | 3 |
| ISTP | 2 | 2 | 4 | ESTP | 5 | 2 | 7 |
| ISFP | 1 | 3 | 4 | ESFP | 1 | 1 | 2 |
| INFP | 1 | 0 | 1 | ENFP | 0 | 0 | 0 |
| INTP | 0 | 2 | 2 | ENTP | 0 | 2 | 2 |
| Total | 13 | 21 | 34 | Total | 16 | 18 | 34 |

Table 4: Descriptive analysis

| Statistics measures | Extrovert | Introvert | <i>p</i> -value |
|------------------------------------|---------------------|----------------------|-----------------|
| Mean ± SD | 84.03 ± 7.01 | 83.54 ± 7.57 | 0.917 |
| Median (minimum and maximum) (IQR) | 86.9 (66.69, 94.38) | 85.06 (63.98, 92.41) | |
| Mode | 87.18 | 85.14 | |
| Variance | 49.19 | 57.31 | |

IQR, interquartile range; SD< standard deviation

(ISFJ); introversion, intuition, feeling, judging (INFJ); introversion, intuition, thinking, judging (INTJ); introversion, sensing, thinking, perceiving (ISTP); introversion, sensing, feeling, perceiving (ISFP); introversion, intuition, feeling, perceiving (INFP); introversion, intuition, thinking, perceiving (INTP); extroversion, sensing, thinking, judging (ESTJ); extroversion, sensing, feeling, judging (ESFJ); extroversion, intuition, feeling, judging (ENFJ); extroversion, intuition, thinking, judging (ENTJ); extroversion, sensing, thinking, perceiving (ESTP); extroversion, sensing, feeling, perceiving (ESFP); extroversion, intuition, feeling, perceiving (ENFP); and extroversion, intuition, thinking, perceiving (ENTP).⁶

Table 3 displays the classification of students into the following two groups: Introverts and extroverts. Of these, 13 male students and 21 female students were classified as introverts whereas 16 male students and 18 female students were categorized as extroverts.

Descriptive Analysis of the Clinical Performance of the Two Personality Groups

The introvert group has a maximum grade of 92.41 and a minimum grade of 63.98, as seen in Table 4. The calculated mean and standard deviation were 83.54 ± 7.57, falling inside the 80 to less than 85-grade range (grade II) and denoting “very good.” The maximum score for the extrovert group is 94.38, while the minimum score is 66.69. The mean and standard deviation (SD) were calculated to be 84.03, which falls into the grade II (from 80 to <85) range and is considered “very good.” Between the two test groups, no discernible differences were found ($p = 0.917$).

Testing for Normalcy in Data

To ascertain if the data in each grading category of the students’ clinical performance had a normal distribution, the researchers employed the Shapiro–Wilk test. Less than 50 sample sizes are



Table 5: Normality data testing

| Group | Shapiro–Wilk test | | | Result |
|-----------|--------------------|-----------------|--|----------|
| | Statistic <i>W</i> | <i>p</i> -value | Critical value of <i>W</i> (5% significance) | |
| Introvert | 0.920108 | 0.016* | 0.936936 | Abnormal |
| Extrovert | 0.911779 | 0.009* | 0.936936 | Abnormal |

*Significant defenses at 0.005

Table 6: Levene's test using the F distribution

| <i>df</i> ₁ | <i>df</i> ₂ | <i>F</i> Statistic | <i>p</i> -value |
|------------------------|------------------------|--------------------|-----------------|
| 1 | 66 | 0.153 | 0.697 |

Table 7: Mann–Whitney *U*-test

| Group | Sum of rank | Mean rank | <i>U</i> -value | <i>Z</i> -ratio | <i>p</i> -value |
|-----------|-------------|-----------|-----------------|-----------------|-----------------|
| Introvert | 1164 | 34.24 | 587 | −0.1043 | 0.917 |
| Extrovert | 1182 | 34.76 | 569 | | |

suitable for this test's methodology. Level-6 dental students who were introverts or extroverts showed substantially different grades in their clinical performance or had an abnormal distribution (*p*-values for introverts and extroverts, respectively, were 0.016 and 0.009), and their *W* Statistic was below the essential value (Table 5).

Degree of Consistency

The degree of consistency between sampling units within a population is known as homogeneity. Testing the homogeneity of the data is necessary as it was discovered that the distribution of the data for the two personality groups was aberrant. To determine whether the variances of the two personality groups are equal—a condition known as homogeneity of variance—Levene's test was employed. Since the calculated *p*-value of 0.697 is more than 0.05 ($p > 0.05$), null hypothesis (*H*₀) is accepted, indicating that it was presumed that the two groups' averages were equal. With an *F* Statistic of 0.153, the 95% acceptability zone is reached (Table 6).

Hypothesis Testing

The Mann–Whitney *U*-test was employed by the researchers to ascertain the acceptance or rejection of the hypothesis in this personality-type study. This test evaluates the differences between two independent groups when the dependent variable is related to an order or constant instead of regularly distributed. The *p*-value was calculated as 0.917 (Table 7).

Based on the aim of the study which is to identify introvert and extrovert personality types among Level-6 dental students in the College of Dentistry, Jazan University, Jazan, Saudi Arabia, and analyze their clinical performance, it was revealed from the results of this study that the variables do not significantly differ from one another.

DISCUSSION

There were 72 level-6 dental students who were given the MBTI questionnaire but only 68 students completed and submitted their responses. All 68 level-6 students at the College of Dentistry are included in this study (39 females and 29 males). To ascertain their personality type, each participant completed and provided their MBTI answers. There were 34 students classed as extroverts

and 34 students classified as introverts overall. Using the Short Dark Triad personality inventory, Jonason and Sherman computed the connections between personality traits and situational perceptions. Their study revealed that extroversion was absolutely connected with duty, intellect, positivity, and sociality.² This conclusion runs counter to our findings, which may be because the two research studies utilized different scales.

A person's personality is a permanent configuration of traits and behaviors that make up their way of adjusting to life. These behaviors and characteristics include their primary traits, interests, desires, values, abilities, self-concept, and emotional patterns. Though different theories provide diverse explanations for the construction and evolution of personality, they all concur that personality plays a role in shaping behavior.²⁰

Introversion and extroversion are the two opposing attitude and function types of personalities that Jung recognized and classified in his analytical psychology theory. He classified personalities based on a variety of factors, including traits-related conduct (e.g., assertiveness and friendliness), viewpoints (either an objective or subjective worldview), and cognitive or analytical behavior.

The differences between these two personality types regarding task management and performance at work have been the subject of numerous research. Logic and attention to detail are traits that introverts frequently bring to the workplace. Introverts can assist the team in producing high-quality work to tackle challenging tasks when they contemplate and take the time to comprehend issues.²¹ To understand the reason behind the substantial body of research showing a negative correlation between introverts and leadership in the workplace, researchers looked at introverts' perceptions of themselves as quiet, reserved, and having lower social skills than extroverts. As a result, introverts may inhibit knowledge sharing.^{1,16} At work, extroverts may come across as "team players." As a result, extroverted traits may be linked to more pay, accolades, and promotions.²² Additionally, extroverts foster camaraderie among their coworkers by interacting and conversing with others in the workplace. Extroverts can contribute to a company's positive attitude by interacting with others in a nice manner and maintaining an optimistic outlook.²³

Researchers conducted this study because of the impact behavior has on how well the two distinct personalities succeed in handling duties in the workplace.²⁴ Since dental schools are the first places where dental practice competence is developed, it is necessary to examine how the two personalities affect students' ability to provide patients with high-quality dental treatment.^{25,26} Tworek states that it is possible to achieve the best of both behaviors by utilizing the strengths and limitations of each personality type.¹⁷ Therefore, instructors are essential in assisting students in interacting with patients and the dental team as they overcome their personality restrictions. Persky et al. discovered that when designed well, active learning activities benefited students of both personality types and did not harm introverted individuals. It is beneficial to give the students thinking time before starting a discussion.²⁷

This study clarifies that personality types have an impact on the level of care that students will provide for their patients. As novices in the field of dentistry, students are learning new material, honing their practical abilities, and changing their mindset to one of professionalism. Therefore, it is important for instructors and students to understand the potential effects of various personality types on clinical performance. Awareness and support in such cases are essential.

The overall mean scores of the respondents in both groups, which are interpreted as “very good” based on the Criteria Reference Scale used by Jazan University–College of Dentistry,¹⁹ showed that the students were able to overcome and step outside of their comfort zone to demonstrate their dental skills in pursuit of the high-quality care they wish to provide to patients, despite the limitations and weaknesses caused by their personalities.

The result of the Shapiro–Wilk test showed that the clinical performance grades of dentistry students, whether introverted or extroverted, had an aberrant distribution because the statistical significance was below the critical value. Given this outcome, it is fundamental to determine whether the data were homogeneous. Using Levene’s test, it was indicated that the two groups’ averages were taken to be equal.

Our study’s primary limitation was the small number of participants—less than 50 people in each independent group—and the fact that it only examined one clinical level. Therefore, using a bigger sample group and varied study stages would allow for a more thorough evaluation of the accuracy of the data. It’s important to look at the attitudes, knowledge, and abilities of the students. Further research can address the gender comparison in addition to other dental topics.

CONCLUSION

Using the MBTI, the two personality types of the respondents who were dentistry students in this study were determined. Numerous theories and studies have shown that the behavior, attributes, strengths, weaknesses, perspectives, and preferences of the introvert personality group differ from those of the extrovert personality group. However, all of them stated that different personality groups have the potential to improve or degrade the caliber of the work they produce.

This study reveals that despite the constraints and flaws brought on by their personalities, the respondents were able to overcome and step outside of their comfort zone to display their dentistry skills in pursuit of the high-quality treatment they wish to deliver to patients as shown on the descriptive data analysis of their clinical performance. Therefore, there is no discernible difference in the clinical performance of dental students who are introverts and extroverts. The null hypothesis is accepted.

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