The Relationship Between Stress Tolerance, Cognitive Emotion Regulation and Temperament Types: Pre-Service Teachers Example

Stres Toleransı, Bilişsel Duygu Düzenleme ve Mizaç Tipleri Arasındaki İlişki: Öğretmen Adayı Örneği

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ABSTRACT

The current study employing the mixed design to qualitatively and quantitatively investigate the relationship between pre-service physical education teachers' temperament types, cognitive emotion regulation strategies, and stress tolerance level aims to contribute to the features loaded onto the "quality teacher" concept. In determining the participants, a convenience sampling method, one of the non-random sampling methods was used. The study's sampling comprises 92 females and 167 males, a total of 259, pre-service physical education teachers. The participants were administered a questionnaire made up of the scales of the Stress Tolerance Test in the Vienna Test System (DT-test), Cognitive Emotion Regulation, and the Nine Temperaments Model (NTTM). The qualitative data were collected by recording the participating pre-service teachers' responses to the semi-structured open-ended questions. While quantitative data were analyzed with the SPSS 24 package program, qualitative data were written down, defined according to certain phenomena, and interpreted with the analysis in depth and richness. The temperament types of the students were found to lead to significant differences in the sub-dimensions of cognitive emotion regulation and the stress tolerance correct reaction time median values. The qualitative findings of the current study support the quantitative findings.

Keywords: Emotion, stress tolerance, temperament, mixed design, quality teacher

ÖZET

Beden eğitimi öğretmen adaylarının mizaç modelleri, bilişsel duygu düzenleme stratejileri ve stres tolerans düzeylerini nicel ve nitel fazda inceleyen karma desendeki bu çalışmada "nitelikli öğretmen" kavramına yüklenen özelliklere katkı sağlamak amaçlanmıştır. Katılımcıların belirlenmesinde, seçkisiz olmayan örnekleme yöntemlerinden uygun örneklem yöntemi kullanılmıştır. 92 kadın (%35.5) 167 erkek (%64.5) olmak üzere toplam 259 beden eğitimi öğretmen adayı (22.74±3.47) çalışmanın örneklemini oluşturmaktadır. Katılımcılara, Viyana Test Sisteminin Stres Tolerans (DT-test) testi, Bilişsel Duygu Düzenleme ve Dokuz Tip Mizaç Modeli (DTMM) ölçeklerini içeren anket formu uygulatılmıştır. Nitel veriler, yarı yapılandırılmış açık uçlu sorulara verilen cevapların ses kayıt cihazına kaydedilmesi ile toplanmıştır. Katılımcıların mizaç tipi durumuna göre bilişsel duygu düzenleme alt boyutlarına ilişkin karşılaştırmalar incelendiğinde, istatistiksel olarak anlamlı farklılıklar saptanmıştır. Mizaç tipi durumu dikkate alındığında, stres toleransı doğru reaksiyon zaman medyanı değerlerinde istatistiksel olarak anlamlı farklılıklar bulunmuştur. Çalışmada elde edilen nitel bulgular nicel bulguları destekler niteliktedir.

Anahtar Kelimeler: Duygu, stres toleransı, mizaç, karma desen, nitelikli öğretmen

INTRODUCTION

Today, research focusing on the necessity of knowing and understanding the individual in all respects before starting his/her education within an effective learning-teaching environment has brought together many different disciplines. Considering the differences between the disciplines and the intersections caused by the interaction, researchers such as Menges (2016), Rasmussen (2015), Weinberg & Gould (2014) discuss different aspects of the concepts such as personality, character and temperament used to get to know the individual. The concept of temperament is considered as a starting point allowing addressing individual differences in a holistic framework and naturally existing in the individual's genetic inheritance and nature (Stolarski et al., 2021). The practices aimed at determining the type of the temperament that the person has are not grounded on certain standardization but on a comprehensive and theoretical basis through which each individual is evaluated by various model-based processes and interpretations (Kopala-Sibley et al., 2018; Selçuk & Yılmaz, 2015). Seen from this perspective, the presence of teachers who know themselves and manage their psychological processes in educational environments will contribute to the education of individuals who may reveal their own characteristics and potentials (Selçuk & Yılmaz, 2015; Carol & Miriam, 2006). Especially in environments where practical activities such as physical education activities are carried out, the teacher's use of personality-oriented applications based on observations and practices may provide positive contributions to the students' development. For this resaon the Nine Types Temperament Model (NTTM), which is built on how we look at the nature of human beings, is a comprehensive and practical mental tool from theory to practice and can address actors such as the teacher, the student, parents and peers etc. together in a holistic framework in educational environments (Yılmaz et al., 2014a). This model consists of nine different temperaments. These are; Perfection Seeking (NTT1), Seeking to Feel Emotions (NTT2), Admirable Self-image Seeking (NTT3), Seeking the Meaning of Emotions (NTT4), Seeking the Meaning of Knowledge (NTT5), Intellectual Serenity Seeking (NTT6), Seeking the Joy of Discovery (NTT7), Absolute Power Seeking (NTT8) and Sensory Motor Comfort Seeking (NTT9). According to the model, individuals can exhibit positive or negative characteristics of other temperament types under stress and relaxation (Aycan, 2017). The point that should be considered in education is that the development of the personality structure of the student should be in line with his/her temperamental characteristics, that his/her" natural personality" should be parallel to his/her behaviours and that teachers should care about the necessity of this (Yılmaz et al., 2014b). In addition, the ability of instructors to regulate their emotional state

in the face of stress, anxiety and difficulties is another factor that positively improves the teacher-learner relationship (Uludag-Uyanıker, 2020). In their widest sense, emotions are integrated structures that contain both physiological and cognitive elements that affect behaviour (Garnefski et al., 2004; Rugancı & Gençöz, 2010). Within the scope of the direct impact area of emotions is there the individual's perception system, information processing process, thoughts about the situation he/she may encounter and reactions to be exhibited against this situation (Koschmieder & Neubauer, 2021; Çelik & Kocabıyık, 2014). For this reason, the concept of "Emotion Regulation", which is thought to affect students' behaviour and support their persistence in the educational environment, has been a popular subject of the related research in recent years (Taxer & Gross, 2018; Morrish et al., 2018). According to Garnefski et al. (2001), while emotion regulation has a wide range of social and behavioural impact domains, it also includes controlled and reflexive cognitive processes. It is argued that individuals create cognitive elements before they develop an emotional response to any situation they face (Garnefski & Kraaij, 2007; Gratz & Roomer, 2004). Although the regulation of emotions through cognitive processes is called "Cognitive Emotion Regulation", this concept is also related to terms such as "self-blame, acceptance, focus on thought, positive refocusing" (Sakakibara, & Endo, 2016; Onat & Otrar, 2010). Cognitive Emotion Regulation Strategies are effective in solving behavioural and social problems, especially arising from being exposed to stressful events (Zlomke, & Hahn, 2010; Garnefski & Kraaij, 2006). Cognitive emotion regulation may help teachers in the stages of providing control, evaluation and accomplishment of objectives in educational environments, as well as contributing to the quality of education with stress management strategies (Corno & Anderman, 2016; Bonanno, & Burton, 2013). The teachers who know themselves, their temperament and emotional state, are at peace with themselves, may manage their stress and may provide a universal education suitable for their students to be unique will provide more opportunities for the success of new generations. The results of this mixed-design study, which qualitatively and quantitatively examined the relationship between pre-service physical education teachers' temperament types, cognitive emotion regulation strategies, and stress tolerance levels, are expected to inform the planning and implementation of educational and instructional programs at universities. Additionally, other aims of the current research are to shed light on other studies and to contribute to the exhibition of behaviours consistent with professional competences and balanced personality as a result of the participants' increasing awareness.

METHOD

Research Design: While the sequential explanatory design (Creswell & Clark, 2018), which is among the mixed methods, constitutes the methodological basis of the research, in this design, which includes a two-stage process, the data obtained from quantitative methods are explained by associating them with qualitative methods. After obtaining the necessary permissions for the research, the tests were applied to the participants who were invited to the Sport Psychology Laboratory at the same time of the day, between 10:00-17:00, by appointment system.

Study Group: In determining the participants, a convenience sampling method, one of the non-random sampling methods were used. The study group of the current research is comprised of 92 females (35.5%) and 167 males (64.5%), a total of 259, pre-service physical education teachers attending the Faculty of Sports Sciences of Ege University. The mean age of the participants is 22.74±3.47.

Data Collection Tools: The scales used to collect quantitative data in the study are a Demographic Information Form, the Cognitive Emotion Regulation Scale and Nine Temperament Types Model Scale. The qualitative data were obtained through the interview technique with which the researcher attempts to reveal concepts, meanings and relationships by asking questions and in which the role of the researcher is kept limited to the collection, analysis and interpretation of the findings related to the phenomenon of interest. "The standardized open-ended interview" form method and voice recorder were used in the data collection process. This approach involves asking a series of carefully prepared questions in the same order and style to each interviewee (Tuckman, 1999). In the questionnaire, semi-structured open-ended questions were asked to the participants.

Q1: What are you experiencing in the process of fulfilling your task under stress and do you use a specific method to reduce your stress?

Q2: Can you regulate your emotional state and which way do you follow for this?

Q3: What are the characteristics of your temperament, can you explain them?

Cognitive emotion regulation scale: The scale developed by Garnefski et al. (2001) to measure cognitive emotion regulation strategies used by individuals to regulate their emotions after experiencing stressful events or to generally regulate their emotions is a five-point Likert scale including 36 items and 9 sub-dimensions. The appropriateness of the distinction between adaptive and nonadaptive coping strategies were measured by two-level confirmatory factor analysis conducted by Garnefski et al. (2002). The results of the confirmatory factor analysis confirmed that "acceptance", "refocus on planning", "positive refocusing" and "positive reappraisal" and "putting into perspective" dimensions are adaptive emotion regulation strategies while "self-blame", "other-blame", "focus on thought", and "catastrophizing" dimensions are nonadaptive emotion regulation strategies ($\chi 2(94) =125$, $p<.05$). As a result of the reliability and validity studies of the scale adapted to Turkish by Onat & Otrar (2010), the internal consistency coefficient was found to be .78 and the test-retest reliability coefficient was found to be "r=.1,00". Within the context of the validity studies of the scale, the criterion-dependent validity method was used.

Table 1. Reliability analysis results of the cognitive emotion regulation scale sub-dimensions

Sub-dimensions of the Scale	The Number of Items	Reliability Coefficient
Self-blame	4	.58
Acceptance	4	.60
Focus on thought	4	.72
Positive refocusing	4	.42
Refocus on planning	4	.71
Positive reappraisal	4	.67
Putting into perspective	4	.62
Catastrophizing	4	.76
Other-blame	4	.77

As a result of the reliability analysis (cronbach alpha method) applied to the sub-dimensions of the scale, the reliability coefficients were found to be ranging from .42 to .77. In reliability analysis studies, the internal consistency values that are .70 and higher are considered to be acceptable according to Nunnally (1978) & Büyüköztürk (2005), .60 and higher are considered to be acceptable according to Özdamar (1999) and .50 and higher are considered to be acceptable in the items responded on the basis of participants' preferences according to Tuckman (1999). As the internal consistency coefficient calculated for the "positive refocusing" sub-dimension within the context of the reliability analysis performed in the current study was found to be below the acceptable values stated in the literature, the related sub-dimension of the scale was excluded from the evaluation.

Nine types temperament model scale: The Nine Types Temperament Scale developed by Yılmaz and colleagues (2014a) for Turkish language and culture is a self-report form consisting of 91 items. These temperament types are Perfection Seeking, Seeking to Fell Emotions, Admirable Self Image Seeking, Seeking Meaning of Emotions, Seeking the Meaning of Knowledge, Intellectual Serenity Seeking, Seeking Joy of Discovery, Absolute Power Seeking and Sensory Motor Comfort Seeking. The highest score obtained from the subscales shows the individual's temperament type. The expressions included on the scale are evaluated and calculated over the participants' responses in the form of 1= No, 2=Sometimes and 3= Yes. According to the exploratory factor analysis, the values of the nine-factor construct range between 8.08 and 1.66 and the variance of explanation was found as 39.04%. Internal consistency coefficient was calculated as .75 for the entire scale and as 77, .79, .68, .71, .80, .74, .71, .83, .77 for the temperament types respectively.

Vienne test system (VTS): This system includes clinical and research-oriented tests developed and spread to the world by the Austrian-based Schuhfried Ges. MB.H. company for use in clinical and applied psychology. In the current study, the Stress Tolerance Level Test (Determination Test – DT), one of the tests found in the VTS Sports Battery and an information form were used.

Determination Test- DT: It is a test to measure reaction speed and quality of stress tolerance under intense flow of stimuli. The ability to react accurately and rapidly to the continuously changing multiple choice (different colour visual - different frequency sound) stimuli during the application process of the test is measured. Since the speed of stimuli gradually increases, the reactions at the stage where the intense stimulus flow begins show the performance under stress. From among the various forms of the test, the form S5 is employed in the current study. In this test, which was prepared in the response mode, 20 stimuli for the trial, and 540 stimuli for the real test are presented at the speeds of 834, 748 and 1078 ms. In the current study, a decision index was used for the results of this test. Determination response time (detertz) is the speed median value of the correct responses to stimuli as time, the number of correct responses given to stimuli is the correct number of determinations (deterdog) (http://psychologischtesten.nl/).

Data Analysis: The data collected in the current study were analyzed using SPSS 24.0 program package. Whether the continuous variables are normally distributed or not was checked; as stated by Shao (2002), on the basis of the -2 and +2 skewness and Kurtosis values calculated for the data (Alpar, 2020).

A data analysis plan was prepared before conducting the content analysis on the qualitative data of the current study. According to Yurdakul (2008), in this process where an inductive approach is followed, the following stages should be gone through: preliminary preparation, encoding qualitative data; reaching themes; organizing data and interpreting and reporting qualitative findings. Then, the data obtained by a voice recorder according to this system were transcribed and defined according to certain phenomena and interpreted with the analyses embedded in the depth and richness of the data.

Ethics Committee Approval: The compliance of this study with ethical rules was approved unanimously by the Ege University Scientific Research and Publication Ethics Committee (Decision no:02/10 protocol:11).

RESULTS

In the current study conducted on a total of 269 (92 females and 167 males) pre-service physical education teachers, it was determined that 44 (17.0%) of the participants belong to NTT1; 60 (23.2%) belong to NTT2; 6 (2.3%) belong to NTT3; 4 (1.5%) belong to NTT4; 22 (8.5%) belong to NTT5; 23 (8.9%) belong to NTT6; 32 (12.4%) belong to NTT7, 32 (12.4%) belong to NTT8 and 36 (13.9%) belong to NTT9.

Table 2. Results of the comparisons made between the participants' NTTM types and cognitive emotion regulation sub-dimension

		Self-blame				Acceptance				Focus on thought			
Type	n	Mean rank	Kwh	p	Bonferroni	Mean rank	Kwh	p	Bonferroni	Mean rank	Kwh	p	Bonferroni
NTT1	44	121.38				116.93				140.52			
NTT2	60	140.12			2>7;2>8	138.27			2>8	131.77			
NTT3	6	155.58				139.58				132.58			
NTT4	4	205.63	21.969	.01*	4>8;4>7;4>1	147.13	17.567	.02*		220.38	21.277	.01*	4>7
NTT5	22	155.52			5>8;5>7	158.55			5>8;5>7;5>1	122.64			
NTT6	23	151.35			6>8; 6>7	161.41			6>8;6>7;6>1	152.11			
NTT7	32	101.95				107.69				87.75			
NTT8	32	97.41				101.52				144.08			
NTT9	36	135.68			9>8	136.33				119.14			

		Refocus on planning				Positive reappraisal				Putting into perspective			
Type	n	Mean rank	Kwh	p	Bonferroni	Mean rank	Kwh	p	Bonferroni	Mean rank	Kwh	p	Bonferroni
NTT1	44	160.98			1>5;1>2	145.42				116.95			
NTT2	60	110.78				123.49				145.12			
NTT3	6	180.08				164.92				129.67			
NTT4	4	164.88	41.390	.00*		135.50	10.895	.21	-	124.25	6.414	.60	-
NTT5	22	83.98				102.45				128.30			
NTT6	23	103.37				116.11				146.04			
NTT7	32	142.36				128.11				121.64			
NTT8	32	172.92			8>5;8>6;8>9;8>2	152.84				132.70			
NTT9	36	107.94				122.65				117.26			

		Catastrophizing				Other-blame			
Type	n	Mean rank	Kwh	p	Bonferroni	Mean rank	Kwh	p	Bonferroni
NTT1	44	115.0				119.65			
NTT2	60	147.49			2>7	134.79			
NTT3	6	137.08				160.42			
NTT4	4	228.50	27.965	.00**	4>7	208.00	12.474	.13	-
NTT5	22	157.95			5>7	137.27			
NTT6	23	151.93				155.78			
NTT7	32	89.61				113.02			
NTT8	32	125.31				129.48			
NTT9	36	115.78				115.57			

*p<.05; **p<.01

When the relationships between the participants' scores taken from the cognitive emotion regulation sub-dimensions and their temperament types were examined, it was found that there are significant differences in the sub-dimensions of "self-blame", "acceptance", "focus on thought", "refocus on planning" and "catastrophizing" (p<.05) while no significant difference was found in the other sub-dimensions (Table 2).

Table 3. Descriptive statistics related to the participants' tolerance level test parameters

Correct reaction time median (detertz)	n	Min.	Max.	x̄	Sd
1st Interval (MDRT1)	259	.57	.89	.71	.05
2nd Interval (MDRT2)	259	.53	.98	.72	.08
3rd Interval (MDRT3)	259	.55	.95	.70	.07
Correct reaction median (deterdog)					
1st Interval (ZV1)	259	149	180	176.30	4.83
2nd Interval (ZV2)	259	96	180	158.43	16.64
3rd Interval (ZV3)	259	124	180	170.04	9.61

In Table 3, it was found that according to the correct reaction parameter, the rate of achievement of the pre-service teachers in the interval where stimuli come with the speed of 1078 ms is 97.94%; in the second interval where stimuli come with the speed of 834 ms, it is 88.01% and in the third interval where stimuli come with the speed of 948, it is 94.46%. Thus, it can be argued that in long

time spans, the participants were able to produce fast and correct reactions while doing their tasks; that is, they were able to continue to focus.

Table 4. Results of the comparisons made between the participants' stress tolerance level (detertz/ms) and their temperament types

Stress tolerance	Type	n	Mean rank	Kwh	p	Bonferroni
	NTT1	44	150.90			1|>2
	NTT2	60	99.79			
	NTT3	6	168.00			
Correct reaction time	NTT4	4	77.00			
median (detertz)	NTT5	22	152.20	27.190	.00**	
	NTT6	23	114.48			
	NTT7	32	139.64			
	NTT8	32	111.98			
	NTT9	36	158.15			9>2

**p<.01

In Table 4, there are the participants correct reaction time median mean rank values taken from the stress tolerance test in relation to their temperament type. Statistically significant differences were found between NTT1 and NTT2 and between NTT9 and NTT2 (p<.01). The participants belonging to NTT1 and NTT9 have higher mean rank values than the participants belonging to NTT2, which shows that they have lower stress tolerance performance.

Qualitative Findings: In this part of the current study, the data collected with the thematic coding system are defined and interpreted according to phenomena and are clearly presented. The findings elicited in line with the qualitative sub-problems of the current study are exemplified with the support of suitable excerpts.

Table 5. Conceptual categories related to the pre-service teachers' temperamental characteristics

Concepts	Category	f	%
Disciplined / Normative		44	5.4
Perfectionist	NTT1	15	1.8
Neat / Rigorous		12	1.5
Hard-working		11	1.4
Emotional		141	17.4
Benevolent		64	7.9
Pessimist / Easy-going	NTT2	28	3.5
Not naysayer		57	7.0
Friendly / Sincere		65	8.0
Ambitious		64	7.9
Success-oriented	NTT3	14	1.7
Introvert / Shy		6	0.7
Creative / Different	NTT4	4	0.5
Inquisitive / Reading a lot		7	0.9
Observer / Analytic	NTT5	9	1.1
Unfriendly / Distant		5	0.6
Control-oriented / Sceptic		7	0.9
Responsible	NTT6	15	1.8
Obsessed		13	1.6
Indifferent / Untidy		10	1.2
Entertaining / Funny / Joker	NTT7	44	5.4
Enthusiastic		13	1.6
Extravert		6	0.7
Leader	NTT8	50	6.1
Self-confident / Decisive		10	1.2
Adaptable / Peace-loving		41	5.0
Calm / Peace-seeking	NTT9	19	2.4
Procrastinator		21	2.6
Non-grudger		18	2.2
Total		813	100

In table 5, the concepts used by the participants to express the characteristics of their temperament are categorised on the basis of NTTM. Considering the fact that an individual may have more than one characteristic, the percentages of the total expressions are taken. In this way, it is seen that 43.8% (n=355) have characteristics belonging to NTT2 temperament type; 12.2% (n=99) have

characteristics belonging to NTT9; 10.1% (n=82) have characteristics belonging to NTT1; 9.6% (n=78) have characteristics belonging to NTT3; 8.9% (n=73) have characteristics belonging to NTT7; 7.3% (n=60) have characteristics belonging to NTT8; 4.3% (n=35) have characteristics belonging to NTT6; 2.6% (n=21) have characteristics belonging to NTT5 and 1.2% (n=10) have characteristics belonging to NTT4. Some opinions of the pre-service teachers about the characteristics of temperament are given below:

"I like having fun. I am a light-hearted person; I take everything easy. I do not like rules and discipline. I am a bit shy. I get angry very easily and I forget very easily. I am in the pursuit of adventure, I do not think of troubling things; I dream about beautiful things" (Participant 258, E). NTT7 – Type of Temperament Seeking the Joy of Discovery.

"I am a brave, sociable, friendly person having positive relationships. My behaviours are planned; I am ambitious. I struggle, I cannot stand injustice, I like challenging and I believe that I have leadership characteristics" (Participant 25, K). NTT8 – Type of Temperament Seeking Absolute Power.

Table 6. Conceptual categories related to experiences lived by the pre-service teachers in the process of accomplishing their tasks under stress

Concepts	Category	f	%
Getting angry, furious		46	17.8
Being cool, unfriendly	Behavioral	60	23.2
Being worried, undecided and unable to focus	Cognitive	20	7.7
Getting excited and panicked, trembling, changing heart rate	Physical	50	19.3
Being positively affected from stress, feeling stronger		32	12.3
Being negatively affected from stress, feeling pressurized	Affective	51	19.7
Total		259	100

As can be seen in Table 6, 41% of the pre-service teachers (n=106) explain what they experience under stress through behavioral, 7.7% (n=20) through cognitive, 19.3% (n=50) through physical and 32% (n=83) through affective reactions. In this connection, some student excerpts are given below:

"I am quite relaxed under stress, I do not feel worried at all; I can do anything to be successful" (Participant 158, M). Behavioral – cool / unfriendly (n=60)

"My heart beats under stress, my knees shiver and I sometimes stutter" (Participant 178, M). Physical – Getting excited/panicked/changing heart rate (n=50)

"Stress makes me focused and concentrated" (Participant 124, F). Affective – Positively affected from stress/feeling stronger (n=32)

"When I get captured by stress, I feel pressurized. I feel like I can't succeed" (Participant 73, M). Affective – Negatively affected from stress/ feeling pressurized (n=51)

Table 7. Conceptual categories related to what has been done by the pre-service teachers in the stress-coping process

Concepts	Category	f	%
Trying to calm down		35	13.5
Using breathing techniques	Behavioral	55	21.2
Getting help		17	6.6
Getting isolated and lonely	Affective	25	9.7
Thinking positively		59	22.8
Getting directed to the target, making plans	Cognitive	68	26.2
Total		259	100

As can be seen in Table 7, 13.5% (n=35) of the pre-service teachers prefer behavioral methods to cope with stress, 9.7% (n=25) prefer affective methods, 49% (n=127) prefer cognitive and 27.8% (n=72) prefer physical methods. Some sample opinions of the pre-service teachers are given below:

"In order to cope with my stress, I regulate my breath, I talk positive and I can tell myself that I can do. In this way, I motivate myself" (Participant 145, F). Behavioral – Using breathing techniques (n=55)

"I need to be distanced from crowds and to be alone to reduce my stress, otherwise I feel distressed in the crowd, I get distanced from pessimism, I run away not to be criticized" (Participant 33, F). Affective – Getting isolated and lonely (n=25)

Table 8. Conceptual structures related to the way followed by the pre-service teachers to regulate their emotional state

Concepts	f	%
I suppress my feelings	90	34.7
My feelings are momentary / I directly convey them	49	18.9
I analyze my feelings / think about them / seek for a logic	69	26.6
I run away from my feelings / I put them off / I leave them to time	32	12.4
I regulate my feelings according to the person with whom I am interacting	13	5.0
I get help from people around to regulate my feelings	6	2.3
Total	259	100

As can be seen in Table 8, 34.7% (n=90) of the participants prefer suppressing their feelings in the process of regulating the emotional state, 18.9% (n=49) prefer experiencing their feelings momentarily and directly getting them across, 26.6% (n=69) prefer analyzing their feelings and think about them again, 12.4% (n=32) prefer leaving them to time, putting them off and escaping from them, 5% (n=13) prefer regulating their feelings according to the person with whom they are interacting, 2.3% (n=6) prefer getting help from people around. Some of the opinions expressed by the pre-service teachers about emotion regulation are given below:

"I suppress my feelings; I do not talk to others; I try to do it on my own. I do not show my anger. I try to leave it to time" (Participant 79, F). I suppress my feelings (n=90)

"I usually avoid the subject of emotion regulation. As I feel confused, I let my feelings flow as they are" (Participant 117, M). I run away from my feelings / I put them off / I leave them to time (n=32)

DISCUSSION

Studies on human attitudes and behaviours in the field of psychology from past to present contribute to the development of educational science. In the current study, it was aimed to with NTTM, to shed light on the future studies and to examine pre-service teachers' stress tolerance level and cognitive emotion regulation strategies.

According to descriptive statistical analysis; NTT2; NTT1 and NTT9 temperament types are the most frequently encountered types among the population of the current research. As known, in personality and temperament-based applications, certain judgements can be formed in clinical settings with observational data. However, Yılmaz et al. (2014a) stated when NTTM is used as the starting point of individual differences within a holistic framework, its description, solution and measurement approaches can guide social demands. Krassner et al. (2017), in their study of Chilean, South Korean, Polish and the American subjects, they demonstrated the evidences of intercultural differences in early childhood behaviours. In recent years, many different studies focusing on the parent's factor and cultural differences have made important contributions to contemporary temperament literature (Eisenberg et al., 2009; Casalin et al., 2014). Analyses made on findings obtained from the qualitative section of the current research support quantitative findings. Many of the participants were found to frequently express characteristics belonging to NTT2 (43.8%; n=355). Particularly the frequency of use of the concepts such as "emotional", "warm-hearted", "sincere" and "benevolent" is remarkable;

"*I am a warm-hearted, extravert person who likes speaking and people. I am very good at making friends and establishing mutual relationships. I generally think positive. I do not hold a grudge*" (Participants 75, M).

Prospective physical education teachers' knowing the basic spiritual needs, motivations and personal-social characteristics of each type of temperament will help them design their future educational settings according to their students' types of temperament. For example, for someone having NTT2 type temperament that is the most frequently encountered temperament type among the population of the current study, factors such as feeling loved, being awarded, being accepted and interest in his/her emotional problems are important to increase his/her motivation. It can be said that this type of individuals needs collaborative and group work so that they can be in contact with their surroundings. On the other hand, for someone having NTT1 type temperament, working in more planned, scheduled and regular environments and learning the correct information in a systematic way are of great importance. Another frequently encountered type of temperament in the current study is NTT9 and individuals having this type of temperament may enhance their attention in working environments where there is no conflict and unrest and which is quiet, calm and comfortable. In light of this information, when the teacher knows his/her student's temperament type then he/she can predict the reasons underlying both positive and negative behaviours of this student and then produce solutions.

Among the important findings of the current study, significant differences resulting from the participants' types of temperament in the cognitive emotion regulation sub-dimensions can be shown. Cognitive emotion regulation strategies may occur either automatically or in a controlled, conscious or unconscious way, and the extent to which emotional response components are interdependent in the process of revealing emotions may also vary (Calkins, 1994). According to Gross & Thompson, (2007) clues that trigger emotional reactions need to be evaluated for past-related (preliminary) emotion regulation, because individuals tend to suppress negative emotions rather than regulating the behavioural dimensions of emotion.

It was determined that the mean scores of the participants defined as NTT8 having the type of temperament seeking absolute power in the "self-blame" and "acceptance" sub-dimensions of cognitive emotion regulation are significantly lower than those of the participants having the other types of temperament (p<.05). The results related to these two sub-dimensions belonging to NTT8 seem to support each other because in the nature of NTT8 are their behaviours of a person who is self-confident, oppressive,

challenging, aggressive and prone to violence. This can explain that the pre-service physical education teachers having the NTT8 type temperament are directed to the ways of emotion regulation without being captive to their emotions concerning the event experienced and without blaming themselves. In short, individuals of this temperament type have the characteristics that need to cope with the negative emotional states that may occur in the face of negativity. Moreover, the individuals having the NTT8 temperament type have a significantly higher mean score in the "refocus on planning" sub-dimension. The pre-service teachers having the NTT8 temperament type are combative, initiative, brave, leader, resilient and fast to act and they are expected to keep away from concerns in the face of negative situations and in this way to act by thinking about how to cope with them. It is of prime importance for them to produce new projects, to realize these projects and to lead them. When the qualitative data belonging to the participants with the NTT8 temperament type are examined, concepts supporting the quantitative data are seen;

> "*I cannot stand injustice, I am a responsible person, I have leadership characteristics, I am equal to everyone but I do not quickly trust in people. I like rules and discipline, I warn people violating rules. I know well what to do where, I lead projects and I never give up easily and I focus on planning*" (Participant 197, M).

On the other hand, the members of NTT5 have a significantly lower mean score in the "refocus on planning". The pre-service teachers belonging to the NTT5 type are asocial, introvert, shy, distant and not liking sharing thus it might be thought that these pre-service teachers are directed to finding solutions mostly by focusing on solutions on their own and in isolation and not quickly getting into action and taking decisions. For NTT5s who like to be alone and to travel in the depths of knowledge, it can be said that their desire to be deeply involved in the events they have experienced may distance them from immediately making plans. When the qualitative data belonging to the members of NTT5 temperament type are examined, contents supporting quantitative data are remarkable;

> "*I can express myself well. I am a bit strict, sarcastic. I am meticulous. I have some obsessions about the subjects I need to study. I cannot leave my works uncompleted, if I start something, I finish it. I do not like my personal possessions to be touched by others. I am an introvert person, I spend a lot of time on computer, I read and research. I do not have vain hopes. All my dreams are realistic.*" (Participant 215, M).

The pre-service teachers having the NTT4 temperament type have the highest mean score; significantly higher than those of the other groups, in the "self-blame" sub-dimension of cognitive emotion regulation, this might be because; due to their temperament structure, they are sensitive, overtly emotional, vulnerable and compassionate. Thus, it is possible to think that the pre-service teachers in the NTT4 temperament type can easily reach some self-accusatory thinking dimensions. In addition, the participants with the NTT4 temperament type have the highest mean values; significantly higher than the others, in the sub-dimensions of "focus on thought" and "catastrophizing". At this point, it can be stated that NTTs, who are melancholic in nature, are predisposed to be depressed by continuous thinking and emotional distress caused by excessive susceptibility. The high mean scores of NTTs in the sub-dimensions of "focus on thought" and "catastrophizing" are also reinforced by the fact that they got the highest mean score from the "self-blame" sub-dimension because someone who feels very bad within negative thoughts can easily blame himself/herself. Within the qualitative data obtained for the pre-service teachers with the NTT4 temperament type, concepts supporting the quantitative data are seen;

> "*In regulating my emotional state, I can blame myself; I try to get distanced from people and do it on my own. I experience difficulties in controlling my anger.*" (Participant 183, M).

The highest mean score from the "acceptance" sub-dimension of cognitive emotion regulation was found to belong to NTT6s. In this regard, one of the characteristics of NTT6s; that is, their having an anxious personality, is remarkable. It is known that there is a negative correlation between the "acceptance" sub-dimension of cognitive emotion regulation and anxiety. Stating that the act of acceptance less likely leads to negative thoughts and emotional reactions, Garnefski et al. (2002) emphasize the positive aspects of acceptance. This might explain the high "acceptance" mean score of NTT6s. At the same time as NTT6s have the personality characteristics such as being unsure, hesitant, unassertive and considering all the possibilities, they tend to live events as they are and, in this way, they try to feel safe. The contents of the qualitative data obtained from the pre-service teachers with the NTT6 temperament type seem to support the quantitative data;

> "*In general, I am content with what I have, I can accept everything, I do not much want to be at the forefront. I am usually a shy person. I get easily worried; therefore, I tend to overtly control everything*" (Participant 65, M).

The pre-service teachers having the NTT7 temperament type were found to have the lowest mean scores; significantly lower than those of the others, in the "focus on thought" and "catastrophizing" sub-dimensions. The fact that NTT7s are cheerful, imaginative, extravert, fun-loving and practical and these characteristics of theirs may result in their attempting to find solutions to problems not thinking much about them and with an optimistic perspective. NTT7s tend to forget the past quickly and think about future opportunities, avoid problems and cannot focus on ideas. The pre-service teachers having this temperament type are naturally expected to focus on creative ideas rather than negative ideas in negative situations.

> "*I am a very joyful person, I am very energetic, I always want to be active. I always talk to myself positively and I think about my dreams; I am an optimistic and extravert person. I like adventure but first I want to get to know people well*" (Participant 254, F).

The participants were found to have values higher than average in all the parameters of the stress tolerance test (DT) administered. Thus, it can be argued that in long time spans, the participants were able to produce fast and correct reactions while doing their

tasks; that is, they were able to continue to focus. The performance level having decreased in the second interval increased in the last interval, which shows that the participants persist on under stress and their stress tolerance is high. It can be said that teacher candidates are individuals who have the ability to maintain their task success under stress, and who can provide conscious and intensive perception towards the target, as an extension of their sportive life with struggle. In the literature, there are remarkable studies that are performed with different parameters of VTS and give information about the basic cognitive abilities of athletes (Gierczuk et al., 2012; Furley & Memmert, 2010).

When the qualitative data of the current study related to stress tolerance were examined, it was found that the many of the participants were calm in the process of fulfilling tasks under stress (n=60, 23.2%). They are thought to have reduced the negative effects of stress leading to physical reactions such as changing heartbeat, shivering hands and feet or to mental reactions such as lack of attention by using the stress-coping strategies they knew. The frequent use of cognitive concepts such as "thinking positively (n=59, 22.8%) and staying focused on the target (n=68, 26.2%)" and the use of breathing techniques as a physical reaction (n=55, 21.2%) might have helped the pre-service teachers reduce the negative effects of stress.

> "*I get nervous when I get stressed, but I'm defeating my anger, thinking I should complete my job. Heart palpitations and tension can occur. I try to think positive to cope with.*" (Participant 98, M).

When the temperament types were taken into consideration, in the stress tolerance correct reaction time median values, statistically significant differences were found between NTT1 and NTT2 and between NTT9 and NTT2. NTT2s can maintain their task achievement and target-oriented attention in DT test significantly better than NTT1s and NTT9s and this may be because NTT2s are people who can be combative, oppressive, assertive, and persistent under stress. Under the wing effect of the temperament types defined by Yılmaz et al. (2011), there is a possibility that NTT2 can be affected by NTT3. NTT3s are ambitious, competitive, persistent and cannot put up with failure; these characteristics may have positively affected NTT2s. On the other hand, NTT1s' possibility of acting slowly under stress may increase because such individuals tend to avoid mistakes and complete all the details in a meticulous manner. Things that are not as they should be can lead to tension in the NTT1s; it is a shame for them to be ordinary or average in an important activity. NTT1s overestimate the targets they have not accomplished and then easily turn them into disasters; they can experience difficulties in focusing. There are some concepts seen within the qualitative data that support the quantitative data;

> "*If there is any stress, heart rate, pulse is rising. I am getting tense and aggressive. I first think about what I can do best to beat. I am completely focusing on the event. I think of nothing else.*" (NTT2- Participant 91, M).

> "*If I am stressful, I feel anxious and worried. I'm getting better when I slowly set things into rights. Yet, I always think whether I can do everything thoroughly, whether they will be good. I talk to myself and try to calm down* (Participant 62, F).

The stress tolerance level of NTT9s who attach great importance to conformity and comfort is significantly lower than that of NTT2s, which might be because of their interaction with NTT1s within the wing effect and their being insecure, tense and sceptic under stress. NTT9s are slow in acting and making decision; thus, they may tend to let events occur in their natural flow. When their peace and comfort are spoiled, there can be a decrease in their performance of giving fast and accurate reactions, which supports the findings of the current study.

> "*It is difficult for me to be under stress. I experience difficulties in making decisions and getting into action; for example, I do not want to do anything*" (NTT9-Participant 239, M).

Conclusions: When the findings of the current study and similar or different findings reported in the literature are taken into consideration, it can be thought that individuals' emotions, attitudes and behaviours represent a unity that is organized and has become a habit and that cognitive emotion regulation strategies can be easily affected from individual differences. Given that the inborn temperamental traits of an individual can create tendencies determinant in their behaviours and attitudes towards the external world, it seems to be quite normal that there are considerable differences between the pre-service teachers' temperament types and emotion regulation cognitions. By improving the awareness of educators who play a leading role in the education/teaching environment on DTTM and Cognitive Emotion Regulation concepts, the potential of the teacher to know his/her students better should be increased, and it should be ensured that they adopt a development-supportive attitude in line with their temperament characteristics.

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