



RESEARCH ARTICLE

The importance of the family for psychological symptomatology in a non-clinical population: expressed emotion and perceived maternal control

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ABSTRACT

Objective: In this study, it was aimed to establish whether parental expressed emotion and perceived maternal psychological and behavioral control predict symptoms of depression, anxiety, and aggression and the level of general psychological symptomatology in healthy university students. Also, it was aimed to identify the type of relationships existing between the variables expressed emotion and perceived maternal control.

Method: Beck Depression, Beck Anxiety, Buss-Perry Aggression Inventories, Shortened Level of Expressed Emotion Scale in Adolescents, Psychological Control Scale–Youth Self Report, Parental Monitoring Scale” (mother forms), and a Sociodemographic Data Form were administered to 378 volunteer undergraduate students (260 females, 118 males) at a public university in Ankara.

Results: Results showed that expressed emotion and perceived maternal psychological control significantly predicted symptoms of depression, anxiety, and aggression and the level of psychological symptomatology positively, while maternal behavioral control significantly predicted aggression symptoms negatively. When all three variables were included, each one of them significantly predicted depressive symptoms. Maternal psychological and behavioral control significantly predicted anxiety symptoms. Expressed emotion and maternal psychological control significantly predicted aggression symptoms and expressed emotion significantly predicted the level of general psychological symptomatology.

Conclusion: The results of this study were largely consistent with the literature. For the first time in Turkey, we reported that expressed emotion predicted psychological symptomatology in a healthy population.

Keywords: Expressed emotion, general psychological symptomatology, perceived psychological control, perceived behavioral control.

INTRODUCTION

The importance of biological characteristics such as inheritance and psychosocial factors like early childhood experiences, education, upbringing, and family influence for our psychological well-being and in

the etiology of mental disorders is well known. There is a great and ongoing interest in investigating the role of a person's family situation in this interaction between genes and the environment (1). Two of the most discussed concepts in the literature seeking an understanding of the family role are expressed emotion

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and parental control. Our study is based on these two concepts, investigating their predictive relationship with depressive, anxiety, and aggression symptoms and the level of general psychological symptomatology in a non-clinical university sample.

While expressed emotion (EE) has been studied since the 1950s, it has mostly been identified with family members' attitude, emotion, and behaviors projected on the sick person (2,3). Though the concept also entails positive traits like warmth and intimacy, it generally includes negative states (4), which have been expressed in dimensions like criticism, hostile attitude, and emotional over involvement. Criticism is defined as negative remarks about the sick person, marked by tone of voice and speech content, and by being made overly uncomfortable by the sufferer (5). Hostile attitude, rather than being a particular behavior, involves a general negative attitude against the ill person. Therefore, patient relatives may find it difficult to control their anger towards the sick person, whom they might consider the source of their problems. Emotional over involvement can lead to situations where family members devote themselves for the patient, assume responsibility for day-to-day events, and are unable to look at the situation objectively (3). A review article addressing the relations between various psychological disorders and health problems and EE revealed that in a number of psychological disorders such as depression, eating disorders, post-traumatic stress disorder, addictions, personality disorders, and agoraphobia, high EE had a negative effect on the duration of recurrence, course of the disease, severity of symptoms, and response to treatment (6). There are relatively few studies about EE in non-clinical samples, and the existing ones usually look at childhood or adolescence. First of all, in families with high EE, the probability to have any psychological symptoms was found to be five times higher than in families with low EE (7). A study with mothers and daughters determined that maternal depression symptoms predicted depressive symptoms in the children, which was mediated by criticism (8). Similarly, other studies also found an elevated level of psychological symptoms in children of mothers with a high level of criticism due to EE (9-11). Regarding the subdimensions of EE, a study including mothers and children showed that while a more critical attitude was related with higher internalized (depression, anxiety) and externalized (aggression) psychological symptoms, emotional over-involvement also had a protective effect against externalized symptoms (aggression) (11). A study with middle school students found that all

subdimensions were positively correlated with psychological symptoms (12). In sum, while findings suggest that there might be a positive effect of some subdimensions, most conclude that high EE is a risk factor for psychological symptoms.

Similar to EE, parental control is another concept emphasizing family traits that is thought to affect psychological symptoms (13). This concept includes a number of dimensions: behaviors such as guilt induction, love withdrawal, make persons feel ashamed, and limit their independence, or situations like supervision, control, and awareness of their behaviors (14). Therefore, measures to control the child's behaviors, actions, thoughts, and feelings are seen to be evaluated from 2 perspectives (15). Under psychological control (PC), parents control children's behavior more indirectly, by passive-aggressive means, thus affecting children's self-expression, thinking processes, attachment to parents, and emotions—particularly by inhibiting individuals' autonomy during and after adolescence (14-16). In the literature, a positive correlation between PC and psychological symptoms as well as behavioral problems has been reported (14). Under behavioral control (BC), parents control children's behaviors with more direct methods such as disciplining and supervision. Parents pose the child various conditions, applying control to ensure that children follow these conditions, knowing when they did what where and with whom (15,17-19). In contrast to PC, BC attempts to change and control behaviors rather than emotion and thinking processes, which has been found to be related with higher academic success, life satisfaction, and self-confidence and with a lower level of behavioral problems (15,20,21).

A study on PC in mothers and daughters found that high perceived maternal PC predicted internalized symptoms such as depressive and anxiety symptoms in their daughters (17). Similarly, PC was seen to predict higher depressive symptoms in adolescents (23). A multicultural study seeking cultural differences of this effect, enrolling 14-17-year-old adolescents from South Africa, Bangladesh, China, India, Bosnia, Palestine, Germany, the USA, and Columbia found this effect to be almost universal, perceived maternal PC predicting depression symptoms (24). Two studies investigating externalized symptoms in children and adolescents found that for both sexes, high perceived maternal PC predicted externalized symptoms such as overt, social, and relational aggression (25,26). Regarding sex differences, one study found that high PC did not predict aggression symptoms in male children, while its

prediction of physical aggression in girls almost reached significance level (27). Among studies with Turkish samples, one paper reported that high perceived maternal PC correlated with externalized symptoms like aggression and internalized symptoms like loneliness (28); another study found correlations for internalized as well as externalized symptoms in girls, while in boys only externalized symptoms correlated (22).

Studies on BC are even scarcer and limited to mothers, which further decreases the amount of available research. In contrast with the negative effects of PC, studies indicate that BC may have a positive impact on individuals. A study with an Afro-American sample showed that perceived maternal BC was not correlated with depressive symptoms, while there was a significant negative correlation with delinquency (21). Another study found a negative prediction for physical and relational aggression in boys but no significant correlation in girls (28). One study with a Turkish sample found a negative correlation between perceived maternal BC and internalized as well as externalized symptoms in boys (22); by contrast, another study found that in girls having a deviant friend and bullying were reduced, while there was no significant difference in boys (15). In sum, it can be said that high perceived maternal PC predicts higher internalized (depressive, anxiety, loneliness) and externalized (aggression) symptoms; the correlation of BC with externalized symptoms is negative, while results for internalized symptoms may vary, mainly according to sex.

Our study examines the predictive correlation of EE and perceived maternal PC and BC, two concepts that are similar in some respects, with depressive, anxiety, aggression symptoms, and the level of general psychological symptomatology (LGPS) in a non-clinical university sample. While it is known that the family environment is important for a person's wellbeing, EE has been mainly studied in psychiatric samples or, when in non-clinical samples, mainly with children and adolescents; it appears therefore important that our study is carried out in a non-clinical adult sample to establish this effect in healthy adults. The other concept, parental control, also has been studied mainly in children and adolescents; however, it is known that parental control continues for university students, albeit to a lesser extent (29). Therefore, our study contributes to an understanding of the impact of control on adults. Even if the behaviors measured with these approaches are similar, we could not find either in the Turkish or in the

international literature any research addressing EE and perceived maternal control together, which should be relevant for us to be able to see the whole picture.

METHOD

The study sample consisted of 378 volunteer students from a State university in Ankara from the 1st to the 6th year (1st year: 36.8%, 2nd year: 30.2%, 3rd year: 18.5%, 4th year: 10.6%, 5th year: 1.9%, and 6th year: 2.1%), studying psychology (34.7%), sociology (19%), family and consumer sciences (17.2%), automotive engineering (7.9%), philosophy (7.7%), civil engineering (4.5%), and other subjects (9%); they had no psychiatric diagnoses and had not lost their mother. Their age range was 17-29 years (mean [M]=20.26; standard deviation [SD]=1.78), 260 were female (68.8%) and 118 male (31.2%). Most participants were from a middle-income background (62.7%), the maternal education level in 80% and the paternal education level in 65.1% was high school or below, and in 96.3% of the participants, the father was still alive.

Measures

Sociodemographic Data Form: This form was prepared by the researchers, recording information such as participants' age, sex, subject and year of study, accommodation, income level, presence of psychiatric disorders, parents' education levels, and if they were alive. This article only reports the sociodemographic data relevant to the analysis; the remaining data are presented in their entirety in the thesis version (30).

Beck Depression Inventory (BDI): This instrument was developed by Beck (31) and adapted to Turkish by Hisli (32) to evaluate cognitive, emotional, and motivational symptoms commonly found in depression; it consists of 21 items. The adapted form has a split-half test reliability coefficient of 0.74 and a criterion-related validity coefficient in the range of 0.47-0.63. The adaptation study found an internal consistency coefficient of 0.80, while in our study it was 0.84.

Beck Anxiety Inventory (BAI): Developed by Beck et al. (33), the scale measuring the frequency of various anxiety symptoms consisting of 21 items was adapted to Turkish by Sahin and Erkmén (34). Each item is scored between 0 and 3 points (0=not at all, 1=mildly, 2=moderately, 3=severely), with a total score from 0-63 points. In the adaptation, the test-retest reliability

coefficient was 0.57, the criterion-related validity coefficient was 0.46 with the BDI and between 0.45 and 0.53 with the State-Trait Anxiety Inventory. Internal consistency of the scale in a clinical sample was 0.93, while in the present study, it was 0.88.

Brief Symptom Inventory (BSI): Developed by Derogatis (35) and adapted to Turkish by Sahin and Durak (36), this instrument consisting of 53 items measures various psychological symptoms. Being scored between 0 and 4 (0=not at all, 1=somewhat, 2=moderately, 3=quite a bit, 4=extremely), the total score is between 0 and 212. The instrument includes 5 subdimensions: anxiety, depression, negative self, somatization, and hostility. Its validity was found to be between 0.13 and 0.36 with the UCLA Loneliness Scale, 0.34-0.70 with the BDI, and 0.16-0.42 with the Submissive Behavior Scale. Internal consistency coefficients were between 0.95 and 0.96; in the present study, it was 0.95 for the entire scale.

Buss-Perry Aggression Questionnaire (BPAQ): This instrument was developed by Buss and Perry (37) and adapted to Turkish by Demirtas-Madran (38). The items are scored on a five-point Likert-type scale (extremely uncharacteristic of me to extremely characteristic of me). The scale consists of 29 items in 4 subdimensions: physical and verbal aggression, hostility, and anger. Items 9 and 16 are reverse-scored. Cronbach's alpha for the total scale was 0.97 in the adaptation study and 0.88 in the present work.

Shortened Level of Expressed Emotion Scale in Adolescents (SLEES): This scale was developed by Nelis et al. (39) and adapted to Turkish by Vural et al. (40). It consists of 33 items scored on a 4-point Likert-type scale (not true; mostly untrue; mostly true; true). Items 1-15 and items 31 and 33 are reverse-scored. The instrument consists of the subdimensions Lack of Emotional Support, Irritability, and Intrusiveness. To establish the validity of the measure, the "anger" dimension of the Multidimensional Anger Scale was used, finding a correlation of 0.49. Cronbach's alpha was 0.90 in the adaptation study and 0.91 in the present work.

Psychological Control Scale (mother form) (PCS): Developed by Barber et al. (41), this instrument was adapted to Turkish by Sayil and Kindap (42). It measures the psychological control exerted by parents over adolescents. The scale consists of 8 items scored on a 4-point Likert-type scale (1-not at all like my mother; 4-very much like my mother). Construct validity showed a 2-factor structure (psychological control and parental disrespect). In its validity, perceived

psychological control and parental disrespect were negatively correlated with democratic parenting style and positively with authoritarian type. Cronbach's alpha in the adaptation study was 0.85, in the present study 0.73.

Parental Monitoring Scale (mother form) (PMS): The instrument was developed by Kerr and Stattin (15) and adapted to Turkish by Sayil et al. (43) to assess perceived parental behavioral control. It consists of 8 items scored on a 5-point Likert-type scale (1-never know; 5-always know). The construct validity of the scale, with principal component analysis resulting in a Kaiser-Meyer-Olkin (KMO) value of 0.79 and an eigenvalue above 1, found a 1-factor structure. The internal consistency coefficient in the adaptation study was 0.80 and in the present work 0.90.

Procedure

With the approval of the ethics committee of Hacettepe University, data were collected from October 2016 to January 2017. While the sociodemographic form was always completed first, the other instruments were administered in random order. Before the administration, participants were informed verbally and in a written way without compromising the measurement. After receiving the student volunteers' consent, data were collected in a classroom setting collectively by the researcher. Completing the scales took around 30 minutes.

Statistical Analysis

After data collection, forms were numbered and replies coded with SPSS 22.0. Before the analyses, data entries were checked; data for participants meeting exclusion criteria (psychiatric disorder, loss of mother) or leaving more than 10% of the items blank were not included in the analysis. Subsequently, missed values and outliers were scanned. Finally, normality was assessed by evaluating skewness and kurtosis values; the skewness-kurtosis values obtained for the basic variables being between -1 and +1, it was decided to use parametric tests in the study (44) (see Table 1). All data included in the analysis were assessed as a whole, and to answer the research questions, regression and hierarchical regression analyses were carried out (Table 1).

RESULTS

Descriptive statistics for all continuous variables in the study are presented in Table 2. In line with the study

Table 1: Kurtosis and skewness values for the basic continuous variables in this study

Instrument	N	Skewness	Standard error	Kurtosis	Standard error
SLEES	398	0.95	0.12	0.89	0.24
PMS	398	-0.23	0.12	-0.37	0.24
PCS	398	0.98	0.12	0.85	0.24
BDI	398	0.83	0.12	0.29	0.24
BAI	398	0.95	0.12	0.69	0.24
BPAQ	398	0.33	0.12	-0.08	0.24
PHYSAG	398	0.74	0.12	-0.00	0.24
ANGER	398	0.23	0.12	-0.54	0.24
HOST	398	0.07	0.12	-0.36	0.24
VERBAG	398	0.25	0.12	0.18	0.24
BSI	398	0.95	0.12	0.73	0.24

N: Number of participants, SLEES: Shortened Level of Expressed Emotion Scale in Adolescents, PMS: Parental Monitoring Scale (Behavioral control-mother), PCS: Psychological Control Scale (Anne), BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, BPAQ: Buss-Perry Aggression Questionnaire, PHYSAG: Physical aggression subdimension, ANGER: Anger subdimension, HOST: Hostility subdimension, VERBAG: Verbal aggression subdimension, BSI: Brief Symptom Inventory

Table 2: Descriptive statistics of the basic continuous variables in this study

Instrument	N	Mean	Standard deviation	Range
SLEES	378	58.33	13.51	34-104
PMS	378	25.79	6.82	8-40
PCS	378	12.77	3.68	8-25
BDI	378	10.40	7.09	0-35
BAI	378	11.21	8.39	0-38
BPAQ	378	73.52	16.30	32-118
PHYSAG	378	18.35	6.15	9-35
ANGER	378	18.36	5.88	7-32
HOST	378	22.62	5.72	8-37
VERBAG	378	14.19	3.56	5-25
BSI	378	40.16	27.29	0-127

N: Number of participants, SLEES: Shortened Level of Expressed Emotion Scale in Adolescents, PMS: Parental Monitoring Scale (Behavioral control-mother), PCS: Psychological Control Scale (Anne), BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, BPAQ: Buss-Perry Aggression Questionnaire, PHYSAG: Physical aggression subdimension, ANGER: Anger subdimension, HOST: Hostility subdimension, VERBAG: Verbal aggression subdimension, BSI: Brief Symptom Inventory

aims, first of all Pearson correlation analysis as the basis for regression analysis showing the correlations between all continuous variables of the study is presented in Table 3. In this paper, perceived maternal PC has been abbreviated as PC and perceived maternal BC as BC (Table 2, Table 3).

Results regarding the prediction of depressive, anxiety, aggression symptoms, subdimensions of aggression, and the level of general psychological symptomatology by EE are summarized in Table 4.

According to the results of regression analysis, EE significantly and positively predicted depressive ($F_{1,376}=16.64$, $p<0.01$, $R^2=0.04$), anxiety ($F_{1,376}=9.49$, $p<0.01$, $R^2=0.03$), general aggression symptoms

($F_{1,376}=25.27$, $p<0.01$, $R^2=0.06$) and the aggression subdimensions physical aggression ($F_{1,376}=23.34$, $p<0.01$, $R^2=0.06$), anger ($F_{1,376}=10.40$, $p<0.05$, $R^2=0.03$), hostility ($F_{1,376}=12.39$, $p<0.01$, $R^2=0.03$), and verbal aggression symptoms ($F_{1,376}=11.66$, $p<0.05$, $R^2=0.03$) and level of general psychological symptomatology ($F_{1,376}=16.20$, $p<0.01$, $R^2=0.04$).

Results for the prediction of psychological symptoms by perceived maternal control

As seen in Table 4, according to the results of regression analysis for the predictive relation between PC and BC and depressive, anxiety, aggression symptoms, and level of general psychological symptomatology, PC

Table 3: Results of correlation analysis showing relations between all continuous variables in the study

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. SLEES		0.50**	0.64**	0.62**	0.68**	0.77**	0.21**	0.50**	0.48**	0.40**	0.58**	0.55**	0.50**	0.25**	-0.06	0.10	0.17**	0.14**	0.17**
2. LES			0.51**	0.62**	0.70**	0.75**	0.06	0.24**	0.43**	0.07	0.20**	0.77**	0.51**	0.26**	-0.06	0.09	0.21**	0.06	0.14**
3. IRR				0.75**	0.78**	0.88**	0.14**	0.54**	0.41**	0.21**	0.42**	0.58**	0.61**	0.31**	-0.12*	0.13*	0.19**	0.15**	0.20**
4. INTR					0.79**	0.92**	0.04	0.43**	0.40**	0.08	0.30**	0.66**	0.74**	0.26**	-0.05	0.10*	0.15**	0.12**	0.16**
5. PMS						0.93**	0.14**	0.49**	0.31**	0.18**	0.41**	0.72**	0.64**	0.29**	-0.03	0.11*	0.22**	0.16**	0.21**
6. PCS							0.12*	0.52**	0.33**	0.20**	0.43**	0.75**	0.72**	0.32**	-0.05	0.13*	0.21**	0.15**	0.20**
7. BDI								0.27**	0.21**	0.50**	0.66**	0.061	0.03	0.14**	-0.17**	0.06	0.16**	0.16**	0.17**
8. BAI									0.57**	0.38**	0.73**	0.34**	0.42**	0.27**	-0.05	0.12*	0.17**	0.14**	0.18**
9. BPAQ										0.53**	0.82**	0.28**	0.29**	0.17**	-0.08	0.05	0.14**	0.16**	0.16**
10. PHYSAG											0.81**	0.06	0.14**	0.17**	-0.23**	0.13*	0.21**	0.22**	0.24**
11. ANGER												0.26**	0.32**	0.25**	-0.17**	0.12*	0.22**	0.22**	0.25**
12. HOST													0.59**	0.25**	0.07	0.10*	0.16**	0.11*	0.16**
13. VERBAG														0.25**	0.04	0.09	0.22**	0.16**	0.20**
14. BSI															-0.21**	0.31**	0.44**	0.30**	0.42**
15. ANX																-0.07	-0.11**	-0.32**	-0.26**
16. DEP																	0.44**	0.31**	0.62**
17. NEGSE																		0.51**	0.80**
18. SOM																			0.88**
19. HOST																			

**p<0.001, *p<0.05. SLEES: Shortened Level of Expressed Emotion Scale in Adolescents, LES: Lack of Emotional Support Subscale, IRR: Irritability subscale, INTR: Intrusiveness subscale, PMS: Parental Monitoring Scale (Behavioral control), PCS: Psychological Control Scale, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, BPAQ: Buss-Perry Aggression Questionnaire, PHYSAG: Physical Aggression Subdimension, ANGER: Anger Subdimension, HOST: Hostility Subdimension, VERBAG: Verbal Aggression Subdimension, BSI: Brief Symptom Inventory, ANX: Anxiety dimension, DEP: Depression dimension, NEGSE: Negative self dimension, SOM: Somatization dimension, HOST: Hostility dimension

Table 4: Results for the prediction of expressed emotion and perceived maternal psychological and behavioral control for depressive symptoms, anxiety, and aggression symptoms with their subdimensions and the level of general psychological symptomatology

Dependent variable	Predictor variable	R	R ²	β	t	p
BDI	SLEES	0.20	0.04	0.20	3.96	<0.001
BAI	SLEES	0.16	0.03	0.16	3.08	0.002
BPAQ	SLEES	0.25	0.06	0.25	5.03	<0.001
PHYSAG	SLEES	0.24	0.06	0.24	4.83	<0.001
ANGER	SLEES	0.16	0.03	0.16	3.22	0.001
HOST	SLEES	0.18	0.03	0.18	3.52	<0.001
VERBAG	SLEES	0.17	0.03	0.17	3.42	0.001
BSI	SLEES	0.20	0.04	0.20	4.03	<0.001
BDI	PCS	0.25	0.06	0.25	5.04	<0.001
BAI	PCS	0.25	0.06	0.25	4.89	<0.001
BPAQ	PCS	0.25	0.06	0.25	4.97	<0.001
PHYSAG	PCS	0.17	0.03	0.17	3.29	0.001
ANGER	PCS	0.17	0.03	0.17	3.27	0.001
HOST	PCS	0.27	0.07	0.27	5.44	<0.001
VERBAG	PCS	0.14	0.03	0.14	2.76	0.006
BSI	PCS	0.32	0.10	0.32	6.48	<0.001
BDI	PMS	0.04	0.00	0.04	0.70	0.485
BAI	PMS	0.07	0.01	0.07	1.34	0.182
BPAQ	PMS	0.17	0.03	-0.17	-3.35	0.001
PHYSAG	PMS	0.23	0.05	-0.23	-4.52	<0.001
ANGER	PMS	0.08	0.01	-0.08	-1.57	0.118
HOST	PMS	0.05	0.00	-0.05	-1.04	0.298
VERBAG	PMS	0.17	0.03	-0.17	-3.32	0.001
BSI	PMS	0.05	0.00	-0.05	-0.10	0.319

SLEES: Shortened Level of Expressed Emotion Scale in Adolescents, PMS: Parental Monitoring Scale (Behavioral control), PCS: Psychological Control Scale, BDI: Beck Depression Inventory, BAI: Beck Anxiety Inventory, BPAQ: Buss-Perry Aggression Questionnaire, PHYSAG: Physical Aggression Subdimension, ANGER: Anger Subdimension, HOST: Hostility Subdimension, VERBAG: Verbal Aggression Subdimension, BSI: Short Symptom Inventory

significantly and positively predicted depressive symptoms ($F_{1,376}=25.38$, $p<0.01$, $R^2=0.06$), anxiety ($F_{1,376}=23.94$, $p<0.01$, $R^2=0.06$), general aggression symptoms ($F_{1,376}=24.73$, $p<0.01$, $R^2=0.06$), and the subdimensions physical ($F_{1,376}=10.80$, $p<0.05$, $R^2=0.03$) and verbal aggression ($F_{1,376}=7.59$, $p<0.05$, $R^2=0.07$), anger ($F_{1,376}=10.68$, $p<0.05$, $R^2=0.03$), and hostility ($F_{1,376}=29.54$, $p<0.01$, $R^2=0.07$) symptoms and the level of general psychological symptomatology ($F_{1,376}=42.04$, $p<0.01$, $R^2=0.10$).

However, BC was found not to predict individuals' depressive ($F_{1,376}=0.49$, $p>0.05$), anxiety symptoms ($F_{1,376}=1.79$, $p>0.05$), and level of general psychological symptomatology ($F_{1,376}=1.00$, $p>0.05$). The aggression subdimensions physical ($F_{1,376}=20.45$, $p<0.01$, $R^2=0.05$) and verbal aggression symptoms ($F_{1,376}=11.01$, $p<0.05$, $R^2=0.03$) were predicted significantly and negatively,

while anger ($F_{1,376}=2.46$, $p>0.05$) and hostility symptoms ($F_{1,376}=1.08$, $p>0.05$) were not predicted.

Results of hierarchical regression analysis for the correlations between expressed emotion and psychological and behavioral control variables

As we could not find any study in the literature treating EE and control variables together, we included these variables into the model, considering the level of correlation between predictor variable and dependent variable for the hierarchical regression analysis of the correlations between EE, PC, and BC regarding psychological symptoms. Accordingly, variables were included in the analysis, beginning with the most highly correlated variable and proceeding in order to the variable with the lowest correlations. Results of the hierarchical regression analysis are summarized in

Table 5. As the joint evaluation of all predictor variables was important for our study, the first and second steps of the hierarchical regression analysis are not presented in the table (Table 5).

The contribution of PC, which was entered in the first block for depressive symptoms, was found to be significant ($F_{1,376}=25.38, p<0.01, R^2=0.06$), predicting depressive symptoms significantly ($\beta=0.25, p<0.01$). In

the second block, BC was added to the model and a significant contribution of this variable to the model was found ($F_{2,375}=14.44, p<0.01$). While PC predicted depressive symptoms ($\beta=0.27, p<0.01$), it was seen that after controlling for PC, BC did not predict depressive symptoms ($\beta=0.09, p>0.05$). Variance explained in the second step increased to 7%, but this contribution of 1% was not found to be statistically significant ($R^2=0.07$,

Table 5: Results of hierarchical regression analysis for the correlations between expressed emotion and perceived maternal control (psychological and behavioral control) regarding psychological symptoms

Dependent variable	Predictor variable	F	R	R ²	ΔR ²	F _{change}	B	SHB	β
Depressive symptoms		11.79**	0.30	0.09	0.02**	6.01*			
	SLEES						0.42	0.11	0.22
	PCS						0.12	0.05	0.12
	PMS						0.07	0.03	0.14
Anxiety symptoms		11.12**	0.29	0.08	0.007	2.82**			
	PCS						0.54	0.13	0.24
	PMS						0.18	0.06	0.14
	SLEES						0.06	0.04	0.09
General aggression symptoms		13.25**	0.31	0.10	0.01	3.53			
	SLEES						0.19	0.07	0.16
	PCS						0.71	0.24	0.16
	PMS						-0.23	0.12	-0.01
Physical aggression symptoms		12.38**	0.30	0.09	0.003	1.09			
	SLEES						0.08	0.03	0.17
	PMS						-0.15	0.05	-0.17
	PCS						0.10	0.09	0.06
Anger symptoms		5.06**	0.20	0.04	0.001	0.30			
	PCS						0.18	0.09	0.11
	SLEES						0.05	0.03	0.11
	PMS						-0.03	0.05	-0.03
Hostility symptoms		10.57**	0.28	0.08	0.000	0.12			
	PCS						0.37	0.09	0.24
	SLEES						0.04	0.02	0.08
	PMS						0.02	0.04	-0.02
Verbal aggression symptoms		6.59**	0.22	0.05	0.004	1.39			
	SLEES						0.03	0.02	0.11
	PMS						-0.07	0.03	-0.13
	PCS						0.06	0.05	0.07
Level of general psychological symptomatology		14.98**	0.33	0.11	0.001	0.39			
	PCS						2.12	0.40	0.29
	SLEES						0.18	0.11	0.09
	PMS						0.13	0.20	0.03

*p<0.05, **p<0.001. SLEES: Shortened Level of Expressed Emotion Scale in Adolescents, PMS: Parental Monitoring Scale (Behavioral control) Mother form, PCS: Psychological Control Scale mother form

$\Delta F_{1,375}=3.34$, $p>0.05$). In the third block, EE was added to the model and a significant contribution to the model was found for this variable ($F_{3,374}=11.79$, $p<0.01$). At this point, it was seen that these 3 variables significantly predicted depressive symptoms ($\beta_{PCS}=0.22$, $p<0.01$; $\beta_{PMS}=0.12$, $p<0.05$; $\beta_{SLEES}=0.14$, $p<0.05$). Variance explained increased to 9%, and this change in variance of 2% was significant ($R^2=0.09$, $\Delta F_{1,374}=6.01$, $p<0.05$).

The contribution of PC to the model, added for anxiety symptoms, was significant ($F_{1,376}=23.92$, $p<0.01$), predicted anxiety symptoms significantly ($\beta=0.25$, $p<0.01$), and explained 6% of the variance in correlation ($R^2=0.06$). In the second block, BC was added to the model and a significant contribution to the model was found ($F_{2,375}=15.93$, $p<0.01$). After controlling for PC, BC was seen to predict anxiety symptoms ($\beta_{PMS}=0.13$, $p<0.05$). With the added variable, variance explained increased to 8%, and the contribution of 2% was found to be statistically significant ($R^2=0.08$, $\Delta F_{1,375}=6.14$, $p<0.05$). In the third block, EE was added to the model and a significant contribution of this variable to the model was found ($F_{3,374}=11.12$, $p<0.01$). After controlling for PC and BC, it was seen that EE did not predict anxiety symptoms at a significant level ($\beta_{PCS}=0.24$, $p<0.01$; $\beta_{PMS}=0.14$, $p<0.05$; $\beta_{SLEES}=0.09$, $p>0.05$). Variance explained increased to 8.2%, but this change was not significant ($R^2=0.082$, $\Delta F_{1,374}=2.82$, $p>0.05$).

When EE was added to the model in the first block for general aggression symptoms, the contribution to the model was significant ($F_{1,376}=25.27$, $p<0.01$), general aggression symptoms were predicted significantly ($\beta=0.25$, $p<0.01$), and 6% of variance in correlation was explained ($R^2=0.06$). In the second block, PC was added to the model and its contribution to the model was significant ($F_{2,375}=17.99$, $p<0.01$). After controlling for EE, PC predicted general aggression symptoms ($\beta=0.17$, $p<0.05$). Variance explained increased to 9% and this contribution of 3% was statistically significant ($R^2=0.09$, $\Delta F_{1,375}=10.10$, $p<0.05$). In the third block, BC was added to the model and its contribution to the model was found significant ($F_{3,374}=13.25$, $p<0.01$). After controlling for EE and PC, it was seen that BC did not predict general aggression symptoms at a significant level ($\beta_{SLEES}=0.16$, $p<0.01$; $\beta_{PCS}=0.16$, $p<0.01$; $\beta_{PMS}=-0.01$, $p>0.05$). Variance explained increased to 10% and this 1% change was not found to be significant ($R^2=0.10$, $\Delta F_{1,374}=3.53$, $p>0.05$).

When EE was added to the model in the first block for physical aggression symptoms, its contribution to the model was significant ($F_{1,376}=23.34$, $p<0.01$), it

predicted physical aggression symptoms significantly ($\beta=0.24$, $p<0.01$), and 6% of variance in correlation was explained ($R^2=0.06$). In the second block, BC was added to the model and its contribution to the model was significant ($F_{2,375}=18.03$, $p<0.01$). After controlling for EE, it was seen that BC predicted physical aggression symptoms significantly and negatively ($\beta=-0.18$, $p<0.01$). In the second step, variance explained increased to 8.9%, and this contribution of 2.9% was statistically significant ($R^2=0.09$, $\Delta F_{1,375}=12.03$, $p<0.01$). In the third block, PC was added to the model and its contribution to the model was significant ($F_{3,374}=12.38$, $p<0.01$). After controlling for EE and BC, it was seen that PC did not predict physical aggression symptoms at a significant level ($\beta_{SLEES}=0.17$, $p<0.01$; $\beta_{PMS}=-0.17$, $p<0.01$; $\beta_{PCS}=0.06$, $p>0.05$). Variance explained in the third step increased to 9%, and this change of 0.3% was not significant ($R^2=0.09$, $\Delta F_{1,374}=1.09$, $p>0.05$).

When EE was added to the model in the first block for anger symptoms, its contribution to the model was significant ($F_{1,376}=10.67$, $p<0.01$), it predicted anger symptoms significantly and positively ($\beta=0.17$, $p<0.01$), and explained around 3% of variance in correlation ($R^2=0.028$). In the second block, EE was added to the model and its contribution to the model was significant ($F_{2,375}=7.46$, $p<0.01$). After controlling for PC, it was seen that EE predicted anger symptoms significantly ($\beta=0.11$, $p<0.01$). Variance explained increased to around 4% in the second step, and this 1% contribution was statistically significant ($R^2=0.038$, $\Delta F_{1,375}=4.16$, $p<0.05$). In the third block, BC was added to the model and its contribution to the model was significant ($F_{3,374}=5.06$, $p<0.01$). After controlling for PC and EE, it was seen that BC did not predict anger symptoms significantly and the significance level for EE was marginal ($\beta_{PCS}=0.11$, $p<0.05$; $\beta_{SLEES}=0.11$, $p=0.058$; $\beta_{PMS}=-0.03$, $p>0.05$). The increase of 0.1% in variance was not significant ($R^2=0.039$, $\Delta F_{1,374}=0.30$, $p>0.05$).

When PC was added to the model in the first block for hostility symptoms, its contribution to the model was significant ($F_{1,376}=29.54$, $p<0.01$), it predicted hostility symptoms significantly ($\beta=0.27$, $p<0.01$) and explained around 7.3% of variance in correlation ($R^2=0.073$). In the second block, EE was added to the model and its contribution to the model was significant ($F_{2,375}=15.83$, $p<0.01$). After controlling for PC, it was seen that EE did not predict hostility symptoms significantly ($\beta=0.08$, $p>0.01$). In the second step, variance explained increased to around 7.8%, and this rise of 0.05% was not statistically significant ($R^2=0.078$, $\Delta F_{1,375}=2.04$, $p>0.05$). In the third block, BC was added

to the model and its contribution to the model was significant ($F_{3,374}=10.57$, $p<0.01$). After controlling for PC and EE, it was seen that BC did not predict hostility symptoms significantly, and after adding BC, the level of EE, too, still did not predict hostility symptoms significantly ($\beta_{PCS}=0.24$, $p<0.01$; $\beta_{SLEES}=0.08$, $p>0.05$; $\beta_{PMS}=-0.02$, $p>0.05$). In the third step, there was no change in variance explained whatsoever ($R^2=0.00$, $\Delta F_{1,374}=0.12$, $p>0.05$).

When EE was added to the model in the first block for hostility symptoms, its contribution to the model was significant ($F_{1,376}=11.66$, $p<0.01$), it predicted hostility symptoms significantly ($\beta=0.17$, $p<0.01$) and explained around 3% of variance in correlation ($R^2=0.03$). In the second block, BC was added to the model and its contribution to the model was significant ($F_{2,375}=9.17$, $p<0.01$). After controlling for EE, it was seen that BC predicted verbal aggression symptoms significantly and negatively ($\beta=-0.13$, $p<0.05$). Variance explained in the second step increased to around 5%, and this contribution of 2% was statistically significant ($R^2=0.05$, $\Delta F_{1,375}=6.51$, $p<0.05$). In the third block, PC was added to the model and its contribution to the model was significant ($F_{3,374}=6.59$, $p<0.01$). After controlling for EE and BC, it was seen that PC did not predict verbal aggression symptoms, and after adding PC, EE and BC still did not predict verbal aggression symptoms significantly ($\beta_{SLEES}=0.11$, $p<0.05$; $\beta_{PMS}=-0.13$, $p<0.05$; $\beta_{PCS}=0.07$, $p>0.05$). Variance explained in the third step changed by a statistically insignificant 0.04% ($R^2=0.050$, $\Delta F_{1,374}=1.39$, $p>0.05$).

When PC was added to the model in the first block for level of general psychological symptomatology (LGPS), its contribution to the model was significant ($F_{1,376}=42.04$, $p<0.01$), it predicted LGPS significantly and positively ($\beta=0.32$, $p<0.01$) and explained around 10% of variance in correlation ($R^2=0.10$). In the second block, EE was added to the model, and the contribution of this variable to the model was significant ($F_{2,375}=22.31$, $p<0.01$). After controlling for PC, it was seen that EE did not significantly predict LGPS ($\beta_{SLEES}=0.08$, $p>0.05$). In the second step, variance explained increased to around 11% and this rise was not statistically significant ($R^2=0.01$, $F_{1,375}=2.41$, $p>0.05$). In the third block, BC was added to the model and its contribution to the model was significant ($F_{3,374}=14.98$, $p<0.01$). After controlling for EE and PC, it was seen that BC did not predict LGPS ($\beta_{PCS}=0.29$, $p<0.05$; $\beta_{SLEES}=0.09$, $p>0.05$; $\beta_{PMS}=0.03$, $p>0.05$). Variance explained in the third step increased by a statistically insignificant 0.01% ($R^2=0.107$, $\Delta F_{1,374}=0.389$, $p>0.05$).

DISCUSSION

This study has examined the predictive relation of EE and perceived maternal PC and BC with depressive, anxiety, aggression symptoms, and LGPS in a non-clinical university sample.

The results of our analyses show that in a non-clinical university sample, high EE correlates with higher depressive, anxiety, and aggression symptoms (physical and verbal aggression, hostility, and anger) and with a high level of psychological symptomatology.

While other available studies used different measures for EE, the results are largely similar. Almost all studies reveal that high EE increases internalized symptoms (8-11). Findings in the literature confirm our results for aggression symptoms. Even where the definition of aggression as used in our study was not applied, more than one study supported that high EE increases externalized symptoms (9-11). For LGPS, we did not find any studies in the literature treating this parameter in the same way we measured it in our study. However, considering that the BSI assesses internalized and externalized symptoms, we may say that the abovementioned studies support our result for level of general psychological symptomatology (8-12).

Regarding psychological control, high perceived maternal PC has been found to be related with more depressive, anxiety, aggression symptoms and higher LGPS. Findings in the literature are mostly consistent with our results.

For depressive symptoms, in line with our results many studies revealed that high perceived maternal PC significantly and positively predicts depressive and anxiety symptoms (17,23-27). While in the Turkish literature, internalized symptoms have been assessed (27), we did not find any study directly investigating depressive and anxiety symptoms. Two studies researched internalized symptoms, one of which showed that higher PC increased internalized symptoms (27), while the other one found such a correlation to be valid only for girls (22). With regard to aggression symptoms, there are studies supporting our results (25,26,28) as well as those that do not (27). The difference in the study not supporting our results may originate in the failure to investigate sex differences, which might also be considered a limitation of this study. Equally, we did not find any study directly treating LGPS as a variable for PC. However, results reached by studies looking at internalized and externalized symptoms suggest that results for level of general psychological symptomatology are mostly consistent with the literature (17,23-26,28).

Of the psychological symptoms investigated, high perceived maternal BC was only found to correlate with subdimensions of high aggression, namely, high physical and verbal aggression symptoms. In the literature, we found studies that were consistent with our results for various psychological symptoms and others that were not.

For depressive symptoms, in line with our results Bean et al. (21) found that perceived maternal BC did not predict depressive symptoms. By contrast, some studies reported that perceived maternal BC negatively predicted internalized symptoms (22,28). While we did not find any study treating anxiety directly as a variable, the significant correlation between depressive symptoms and anxiety symptoms ($r=0.60$) suggests that results for depressive symptoms may be partly valid for anxiety symptoms as well. Regarding aggression symptoms, results from the Turkish (15,22) as well as the international literature overall support our findings; however, results differ regarding sex. While this study did not analyze aggression symptoms from the angle of sex difference, it was seen that perceived maternal BC might be protecting from externalized symptoms. We found no study directly addressing LGPS as a variable, but if we consider this complex to be made up of internalized and externalized symptoms, the aforementioned studies may also explain the results reached for LGPS.

While the behaviors considered are similar in specific respects, we found no study in the literature addressing the two concepts together. When we look at the result at the stage where our study investigated the 3 variables together, we see that this research is consistent with the findings in the literature in some respects but not in others. As we have dealt with the consistent aspects above, we will not dwell on them here to avoid repetition. Regarding the inconsistencies, the reason may be the absence of any study assessing the variables jointly, as our findings are compared with the results obtained for the variables individually.

In the light of all results, we have seen that there are common angles between EE and perceived maternal PC and BC in various respects. Similar to clinical samples, high EE and perceived maternal PC may constitute a risk for psychological symptoms in healthy individuals, while BC can be said to protect from various symptoms.

Although there are many studies in the literature done in psychiatric samples, research with non-clinical samples is limited, and the existing ones are generally examining childhood and adolescence; in Turkey, no such study has been done. From this perspective, this

study can be considered a contribution to the Turkish and the general literature. The study is also relevant because it assesses two similar concepts together, parental control and EE, opening a broader perspective on the significance of the family for psychological symptoms in healthy individuals. Studies on parental control have usually been carried out in samples of children and adolescents. However, considering the importance of autonomy after adolescence (15) and the continuing, albeit somewhat reduced, parental control in our sample (29), this study may contribute to the literature a view of the family impact on psychological symptoms in healthy adults.

Apart from the contributions to the literature, there are also a number of benefits for application. While in the West, after the age of 18 years family relations weaken, the family effect continues especially in Turkish culture, and thus information about family attitude and behaviors may protect young family members from psychological symptoms. While there may not be a clinical diagnostic dimension, especially individuals from this age group present with a variety of psychological complaints where receiving detailed information about the family environment, or if needed even including the family in the therapeutic process, intervention in the family environment, and teaching the individual strategies for coping with this kind of behaviors can be relevant in order to reduce the symptoms.

Our study has a number of limitations, the first being that we only examined the maternal aspect of parental control. In addition, having recruited the sample from a single university may limit generalizability. Furthermore, we did not distinguish between the sexes according to symptoms, which might have been relevant, considering the predictable cultural differences between the behaviors of female and male children. As the instruments used were self-report forms, we need to consider the possibility that participants gave biased answers. In the light of these observations, future studies should assess parental control for mothers and fathers together, broaden the results by receiving information from mothers and fathers, too, carry out analyses for sex differences, include demographic characteristics that may affect the variables, access a sample from different regions and universities and carry out interviews to complement the self-report forms, include variables such as coping strategies, perform longitudinal studies that allow to observe the family effect in therapy, and examine this effect in different psychological symptom groups.

To conclude, this study has been carried out to show the family effect on wellbeing and psychological symptoms of healthy individuals. Our results suggest that two of the family-related concepts, expressed emotion and perceived maternal psychological and behavioral control, may be risk factors for the development of psychological symptoms, while behavioral control may be protective against various psychological symptoms. Additional studies are needed to get a broader picture.

Contribution Categories		Author Initials
Category 1	Concept/Design	D.C., I.D.
	Data acquisition	D.C.
	Data analysis/Interpretation	D.C.
Category 2	Drafting manuscript	D.C.
	Critical revision of manuscript	D.C., I.D.
Category 3	Final approval and accountability	I.D., D.C.
Other	Technical or material support	
	Supervision	I.D.

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