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Relationship between Turkish Elementary Science Teachers' Occupational Well-Being and Some Contextual and Demographic Characteristics: A Multivariate Analysis *

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Abstract

The purpose of this study was twofold: first, to determine the Turkish elementary science teachers' occupational well-being profile and second, to investigate the relation of science teachers' occupational well-being to some contextual and demographic characteristics. The contextual variables included class size, years of teaching experience and weekly course hours, while demographic characteristics included gender, graduated faculty, marital status, and having children. Moreover, occupational well-being was examined in terms of job satisfaction and burnout (i.e. emotional exhaustion and personal accomplishment). 376 elementary science teachers that were randomly selected across the Turkey participated in the study. Descriptive statistics and canonical correlation analysis were utilized to analyze the data. Results showed that Turkish elementary science teachers experience low level of Emotional exhaustion and high level of personal accomplishment and job satisfaction. Additionally, it was found that as class size and weekly course hour increase, elementary science teachers tend to experience more emotional exhaustion but less job satisfaction. Teachers having children appeared to experience more emotional exhaustion but less job satisfaction. Moreover, a positive relationship was found between teaching experience and occupational well-being (i.e. job satisfaction and personal accomplishment). Female teachers appeared to experience more personal accomplishment and job satisfaction than male teachers. Similarly, teachers graduated from faculties of arts and sciences were found to have higher level of personal accomplishment and job satisfaction than teachers graduated from educational faculties.

Keywords

Burnout
Job satisfaction
Science teachers
Occupational well-being
Canonical correlation

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Introduction

Since teachers' occupational well-being have been considered as one of the important indicators of effective teaching (Klusman, Kunter, Trautwein, Ludtke, & Baumert, 2008), over the years, there has been a growing body of research examining teachers' occupational well-being. Van Horn, Taris, Schaufeli and Schreurs (2004) considered occupational well-being as "a positive evaluation of various aspects of one's job, including affective, motivational, behavioral, cognitive and psychosomatic dimensions" (Van Horn et al., 2004, p. 366). Research on teachers' occupational well-being frequently focuses on stress, burnout and job dissatisfaction (Klusman et al., 2008; Kyriacou, 2001; Van Horn, et al., 2004). Thus, in the present study, teachers' occupational well-being was investigated in terms of burnout and job satisfaction

As one of the key indicators of teachers' occupational well-being burnout can be defined as "a syndrome of emotional exhaustion and cynicism that occurs frequently among individuals who do 'people-work' of some kind" (Maslach & Jackson, 1981, p. 99). Burnout consists of three dimensions: 1) *emotional exhaustion* which is the feeling of frustration from personal emotional resources and emotionally being overloaded 2) *depersonalization* which is the interpersonal dimension of burnout indicating the feeling of being distant from others and giving negative response to other people at work, and 3) *reduced personal accomplishment* indicating reduction of positive self-evaluations and self-efficacy on the job (Maslach & Jackson, 1981). Although these three dimensions constitute burnout, Maslach and Jackson (1981) regarded feeling of emotional exhaustion as the most important dimension of burnout syndrome.

Teaching is widely considered as physically and psychologically challenging and stressful work (Borg & Riding, 1991; Dorman, 2003; Kieschke & Schaarschmidt, 2008; Kyriacou, 2001). This situation may cause burnout among teachers (Klusman et al., 2008; Jennett, Harris, & Mesibov, 2003) and, in turn, teacher burnout influences the quality of education (Farber, 1982). Therefore, over the years, teacher stress and burnout have received an increasing attention among educational researchers (Betoret, 2006; Kyriacou, 1987; Lee & Ashforth, 1996; Maslach & Jackson, 1981; Zhou & Wen, 2007, 2007). Studies indicated the main sources of stress for teachers as "teaching pupils who lack motivation, maintaining discipline, time pressures and workload, coping with change, being evaluated by others, dealings with colleagues, self-esteem and status, administration and management, role conflict and ambiguity, and poor working conditions" (Kyriacou, 2001, p. 29).

Burnout has negative effects on teachers' instructional performance and on student outcomes (Klusman et al., 2008). It significantly reduces teachers' motivation to continue teaching profession and to be satisfied with their relationship with students (Farber, 1982). Farber and Miller (1981) asserted that a burned out teacher "may be less sympathetic toward students, may have a lower tolerance for frustration in the classroom, may plan for their classes less often or less carefully, may fantasize or actually plan on leaving the profession, may feel frequently emotionally or physically exhausted, may feel anxious, irritable, depressed, and in general, may feel less committed and dedicated to their work" (as cited in Farber, 1982, p. 2). Moreover, these teachers fail to establish effective relationship with their students; provide less praise, and acceptance for the opinions of students; and avoid interactions (Tatar & Yahav, 1999). According to Dworkin (1987), since burned-out teachers are less willing to invest much into their teaching, their students' achievement gains are more likely to be lower. Similarly, teacher burnout may cause reduction in students' learning and performance, perception of self-efficacy in school, feel of competent as learners, intrinsic motivation, and creativity (Maslach & Leiter; 1999).

Job satisfaction is another indicator of occupational well-being and over decades it has been frequently studied by researchers in many different job areas. Studies on teacher job satisfaction revealed that it is a good predictor of their performance at work (Ololube, 2006), self-regulation (Klusman et al., 2008), self-efficacy (Caprara, Barbaranelli, Steca, & Malone, 2006; Skaalvik & Skaalvik, 2010), collective efficacy (Klassen, Usher, & Bong, 2010) and student achievement (Dinham, 1995).

In school settings, there are a variety of variables that are related to teachers' burnout and job satisfaction. According to Özdemir (2007), Turkish teachers have occupational problems which should not be neglected and the factors that cause teacher burnout should be investigated. However, in a different study, Demirel, Güler, Toktamış, Özdemir, and Sezer (2005) indicated that Turkish secondary school teachers' burnout level is lower than teachers in developed countries, such as Italy, Canada, USA, Netherland, and France. In a comparative study, Aydoğan, Doğan, and Bayram (2009) examined the difference among Turkish citizen teachers' burnout levels in Turkey, Germany, and Cyprus by using Shirom-Melamed Burnout Measure (SMBM). They found that teachers working in Cyprus have significantly higher burnout level compared to teachers in Turkey and Germany while there was no significant difference was found between Germany and Turkey in terms of burnout level. These findings show that Turkish teachers have positive attitudes toward their job and satisfy with working as a teacher as much as those teachers who are working in developed countries. Therefore, it seems quite important to find out the fundemantel context and demographic factors that play a role in enhancing teachers' occupational well-being level in high level. Accordingly, in recently, finding the factors contributing teachers' burnout has been the focus of a lot of research. Several researchers stated that a lot of demographic and contextual variables such as class size, students' disruptive behaviors, workload, age, marital status have potential to influence teacher's psychological well-being (Kyriacou, 2001; Maslach, 1982; Michaelowa & Wittmann, 2007). However, in a literature review study by Byrne (1999), it was found that findings of the studies on the relationship between burnout and some demographic variables (e.g., gender, experience, and marital status) yielded inconsistent result.

In Turkey, empirical research on the relations of job satisfaction and burnout to some of these variables has yielded mixed results. For example, in a study with 561 elementary school teachers, Kayabaşı (2008) examined the factors related to teachers' burnout by conducting t-test and ANOVA. The author found that male teachers experienced higher level of personal accomplishment than female teachers while no significant difference was found regarding gender in other sub-dimensions of burnout. Moreover, the author reported no significant difference in any other sub-dimensions of burnout in terms of marital status (married vs single), age groups (23-30, 31-42, and 43+), and graduated faculty type (faculty of education vs science and art faculty). In another study, Telef (2011) examined whether teacher burnout and job satisfaction differentiate depending on demographic variables with 349 elementary school teachers. Telef (2011) performed t-test and ANOVA to test the research questions. Results revealed significant gender effect on neither any sub-dimesnions of burnout nor job satisfaction. Additionally, depersonalization and personal accomplishment were found to be significantly differing for experience, but not emotional exhaustion and job satisfaction. That is, teachers with 20-25 years of teaching experience had lower level of depersonalization and higher level of personal accomplishment than teachers with 1-5 years of teaching experience. Kırılmaz, Çelem, and Sarp (2003) analyzed a data set obtained from 43 primary school teachers to investigate the association between some demographic variables and burnout. Results indicated that none of the three sub-dimensions of burnout was influenced from gender, experience, number of child(ren), and average number of students in classrooms. However, in their study, married teachers reported significantly higher level of personal accomplishment than single teachers.

In short, factors such as gender (Ergin, 1992; Girgin & Baysal, 2005; Kayabaşı, 2008), age (Sucuoğlu & Kuloğlu, 1996; Tümkiye 1996; Tuğrul & Çelik, 2002), experience (Gündüz, 2006; Sarı, 2004), marital status (Ergin, 1992; Izgar, 2001; Tuğrul & Çelik 2002; Tümkiye, 1996) and class size (Cemaloğlu & Şahin, 2007) were found strongly related to Turkish teachers' level of burnout, while in some research studies, no significant relationship of burnout with age (Gündüz, 2006; Kırılmaz, et al. 2003), gender (Gündüz, 2006; Kırılmaz, et al. 2003), marital status (Kayabaşı, 2008), and experience (Gündüz, 2006; Kayabaşı, 2008; Kırılmaz, et al. 2003) was found. Similarly, while, in a study, Peker (2002) found that gender and experience were significantly associated with elementary teachers' job satisfaction, in another study, Taşdan and Tiryaki (2008) found non-significant relationship between elementary teachers' job satisfaction and these demographic variables. In this respect, examination of sampling procedure used in aforementioned studies indicated that these studies did not focus on a particular teaching area such as science, math, and language, and did not make any distinction between elementary teachers based on their branches. With this regard, focusing on a specific teaching area and level will be an important approach to make more reliable comparison of the results of the past research and to better understand the reasons of the differences among their findings. To give an example, in a study conducted with 532 secondary school teachers by Koruklu, Feyzioğlu, Özenoğlu Kiremit, and Aladağ (2012) MANOVA results showed that there were significant differences in all sub-dimensions of burnout in terms of teaching areas. However, in the field of science education, few studies focused on science teachers' work related stress (Halim, Samsudin, Meerah, & Osman, 2006; Okebukola, 1988; Soyibo, 1994), and science teachers' burnout has been rarely studied.

Past research showed that science teachers reported some important factors affecting their well-being in work. For example, a study was conducted by Soyibo (1994) with 230 high school science teachers in Jamaica to explore the most stressful factors in science teaching. He used a 40-item science teacher stress inventory (STSI, developed by Okebukola & Jegede, 1992), to measure science teachers' occupational stress level. Science teachers ranked difficulty in getting science teaching equipment in school, teaching students who are unmotivated to learn science, and coping with teaching difficult science topics as the major sources of stress. Additionally, they ranked fear of getting injured in laboratory accidents, low salary, and fast pace of the school day as factors that have least impact on stress. The similar results were found with Malaysian science teachers (Halim et al., 2006). Experiencing stressful working conditions was found to be a cause a reduction in the science teachers' instructional performance (Halim et al., 2006; Soyibo, 1994). If teachers can not cope with the negative stressors that they faced in work, this situation may cause teachers to burn out (Farber, 1984). According to Farber, some personal and environmental factors take mediator role between stressful conditions and burnout. Therefore, it is important to investigate the role of demographic and contextual variables in science teachers' occupational well-being.

Moreover, aforementioned studies on teacher burnout, especially conducted in Turkey, generally used univariate analysis (i.e., one dependent variable) methods such as Pearson correlation, t-test, ANOVA, and regression in analyzing data, although analyzing by multivariate methods (i.e., more than one dependent variable) such as MANOVA and canonical correlation might have given better results. However in the present study, data will be analyzed by using canonical correlation analysis as a more robust statistical method. Canonical correlation analysis, which is a multivariate analysis technique, is more robust test than univariate techniques in that it decreases the possibility of committing Type I error by correlating several variables simultaneously instead of conducting regression or correlation analysis for each dependent variable separately (Sherry & Henson, 2005). Additionally, canonical correlation analysis maximizes the correlation between the sets of dependent and independent variables by providing linear combination of each set of the variables (Hair, Black, Babin, Anderson, & Tatham, 2010; Sherry & Henson, 2005, Tabachnick & Fidell, 2007). Therefore, it can be said that previous studies which separately examined the association of sub-dimensions of burnout and job satisfaction with some independent variables in a single study were more subject to committing Type 1 error.

In sum, elementary science teachers' occupational well-being is an important indicator of their performance in the classroom and their relationships with students. Therefore it is important to investigate the factors influence their occupational well-being. Although these factors were frequently examined in past studies, sampling procedure make comparison of the results limited, and statistical methods used in those studies seem weak. Thus, in order to increase the possibility of getting consistent results from several studies and to enhance the generalizability of their results, there is a need for studies using more specific sample and more robust statistical methods. Therefore in this study, it is aimed to gain new insights about the associations between teachers' occupational well-being and demographic and contextual factors by using more robust statistical method (canonical correlation analysis) to reduce measurement errors and selecting a particular teaching branch (science) to make more accurate generalization. It is expected that this study will contribute to the literature in that sense and provide a new perspective to the phenomena by multivariate approach. On the other hand, in Turkey, research on science teachers' burnout and job satisfaction is very limited. This study will also enhance the knowledge about Turkish science teachers' job related profiles.

In the light of the findings in the related literature, the purpose of this study is to determine the contextual and demographic characteristics that are related with Turkish elementary science teachers' occupational well-being. The research questions guided this study are:

- 1) What is the Turkish elementary science teachers' occupational well-being profile (i.e. emotional exhaustion, personal accomplishment, and job satisfaction)?
- 2) What is the relationship between a set of Turkish science teachers' contextual (i.e., class size, years of experience, weekly course hours) and demographic characteristics (i.e., gender, graduated faculty, marital status, having children) and a set of their occupational well-being characteristics (emotional exhaustion, personal accomplishment, and job satisfaction)?

Method

Procedure

In this study, with contribution of EARGED/EREDED (Ministry of Education, Education Research and Development Department), correlational survey method was used. 400 public elementary schools across Turkey were randomly selected and schools located in rural areas were not included. The selected school sample represent the 12 territorial units which were defined by Turkish Statistical Institute (TSI, 2005)'s Nomenclature of Territorial Units for Statistics (NUTS) classification. This classification was based on economic, social, cultural, and geographical factors. Questionnaires were sent by mail to the schools and each school was asked to randomly select one of the science teachers to be a participant. All participants were surveyed on one occasion by mail and return rate was 94%.

Sample

Participants of this study were 376 (204 female and 172 male) elementary science teachers. Their ages ranged from 22 to 65 years ($M=35.86$ and $SD=9.21$) and experience ranged from 1 to 38 years ($M=12.02$ and 8.68). The average number of students in a classroom which they teach ranged from 12 to 57 ($M=29.48$ and $SD=6.92$) and their weekly course hours for teaching ranged from 4 to 30 ($M=23.24$ and $SD=4.71$). Additionally, 73.7% of teachers were married and 26.3% were single, 61.2 of teachers had children and 38.8% had no child and 83% of teachers graduated from faculties of education and about 17% graduated from faculties of arts and sciences.

Instruments

Maslach Burnout Inventory

Teachers' burnout was measured by using Educator Survey version of Maslach Burnout Inventory (MBI-ES) (Maslach & Jackson, 1986). MBI includes 22 self-report items and divided into three subscales: Emotional Exhaustion (9 items), Depersonalization (5 items) and Personal Accomplishment (8 items). In Turkish version 5-point likert scale is used. The instrument was validated for Turkish sample by Girgin (1995) and Sucuoğlu and Kuloğlu (1996) separately. In the present study, to check the construct validity of MBI-ES, a confirmatory factor analysis (CFA) was conducted. Result showed good fit to the data ($\chi^2_{(118)} = 278.57, p < .05$; CFI = .97, GFI = .92, NFI = .94, NNFI = .96; SRMR = .07; RMSEA = .06; 90% CI = .05, .07). Examination of burnout is limited to the emotional exhaustion and personal accomplishment (Turkish Ministry of Education gave permission for administration of only these two subscales of MBI-ES) and corresponding Cronbachs' alpha coefficients were .86 for emotional exhaustion, and .75 for personal accomplishment. High scores on emotional exhaustion and low scores on personal accomplishment indicate high level of burnout.

Job Satisfaction

Skaalvik and Skaalvik (2010) indicates that the effect of the different circumstances on teachers' overall job satisfaction vary from teacher to teacher according to how they give importance to these circumstances. Therefore, they recommended not measuring teachers' overall job satisfaction by using concrete circumstances. Thus, teachers' overall satisfaction about their job was assessed by a three-item scale (e.g. "All things considered how much do you enjoy working as a teacher") developed by Skaalvik and Skaalvik (2010). This scale was translated and adapted into Turkish by the researchers. Result of CFA indicated perfect model fit to the data ($\chi^2_{(0)} = 0, p > .05$). Moreover, internal consistency of job satisfaction scale was found as .87. Therefore, the Turkish version of this job satisfaction scale provides reliable and valid information about teachers' satisfaction from their job.

Results

Results of the present study are presented below for both research questions respectively.

Results for Research Question 1

"What is the Turkish elementary science teachers' occupational well-being (i.e. emotional exhaustion, personal accomplishment, and job satisfaction) profile?"

Regarding the first research question, descriptive scores for minimum, maximum, mean and standard deviation of each factors included in the table 1. The cut-off points for each dimensions of burnout can differ for countries (Schaufeli & Dierendock, 1995). For Turkey this points were defined by dividing maximum scores by three (Işıkhan, 2004) and low, medium and large scores were defined for each factors. Since job satisfaction scale has been used first time in Turkey, cut-off points for job satisfaction are defined by researchers by using a similar procedure. Results showed that, teachers experienced low level of emotional exhaustion and high level of personal accomplishment and job satisfaction.

Table 1. Descriptive Statistics of Occupational Well-Being Variables

	Min	Max	Mean	Level	SD
Emotional Exhaustion	0.00	36.00	11.54	low	6.41
Personal Accomplishment	12.00	32.00	25.27	high	3.41
Job Satisfaction	3.00	15.00	12.32	high	2.82

Results for the Second Research Question

“What is the relationship between a set of Turkish science teachers’ contextual (i.e., class size, years of experience, weekly course hours) and demographic characteristics (i.e., gender, graduated faculty, marital status, having children) and a set of their occupational well-being characteristics (emotional exhaustion, personal accomplishment, and job satisfaction)?”

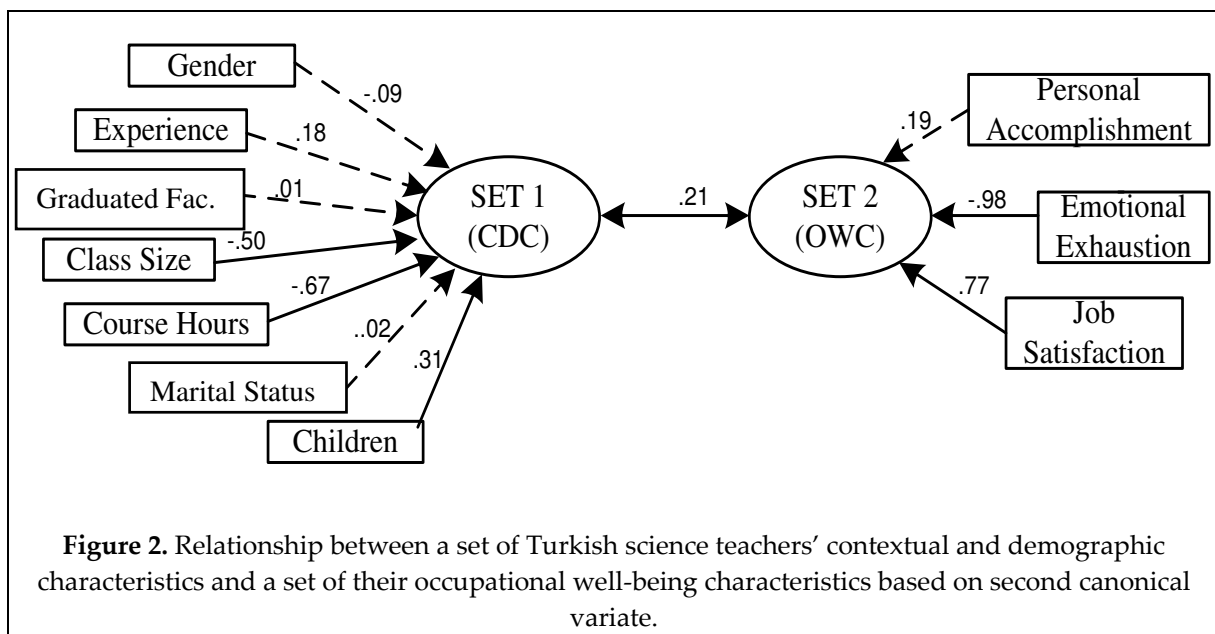
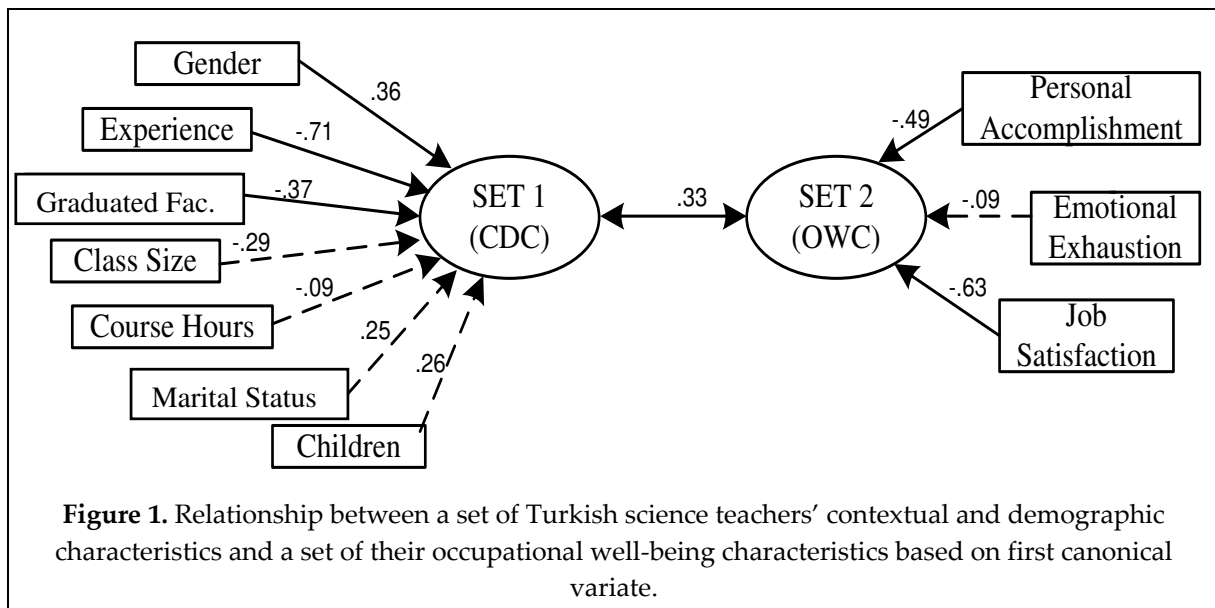
In order to test the second research question, canonical correlation analysis was performed between a set of occupational well-being characteristics (OWC) and a set of contextual and demographic characteristics (CDC). OWC set includes emotional exhaustion, personal accomplishment and job satisfaction. Regarding the other set, contextual characteristics variables include years of experience, class size and weekly course hours for teaching and demographic characteristics variables include graduated faculty type, gender, marital status and having children. The first canonical correlation was .33 (11% overlapping variance), $\chi^2(21) = 66.89$, $p < .000$ and the second canonical correlation was .21 (4% overlapping variance), $\chi^2(12) = 25.37$, $p < .05$. While the first two pairs of canonical variates accounted for the significant relationship, χ^2 test was not statistically significant for the third pair. Therefore interpretation of the results of this study was mainly based on the first two canonical variates. Results were presented in Table 2 with coefficients. Additionally, graphical representations of the results for first and second canonical variates were presented in Figure 1 and Figure 2 respectively.

The first significant canonical variate pair extracted 14.10 % of the variance from the CDC variables and 21.40% of the variance from the OWC variables. The second significant canonical variate pair extracted 11.80% of the variance from the CDC variables and 53% of the variance from the OWC variables.

As shown in Table 2, with a cut off value of .30 (Tabachnick & Fidell, 2007), first canonical variate suggested a positive relationship between teaching experience and occupational well-being (i.e. job satisfaction and personal accomplishment). Female teachers appeared to experience more job satisfaction and personal accomplishment. Similarly, teachers graduated from faculties of arts and sciences were found to have better occupational well-being. On the other hand, second canonical variate indicated that while class size and weekly course hours positively associated with job satisfaction, they were negatively associated with teachers’ emotional exhaustion. Moreover, teachers who had no child reported higher job satisfaction and lower emotional exhaustion.

Table 2. Canonical Correlation Analysis’ Results for First and Second Canonical Variates

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
SET 1				
Gender	0.36	0.53	-0.09	-0.11
Experience	-0.71	-0.99	0.18	0.44
Graduated Faculty Type	-0.37	-0.21	0.01	-0.01
Class Ssize	-0.29	-0.26	-0.50	-0.45
Course Hours	-0.09	-0.32	-0.67	-0.66
Marital Status	0.25	0.13	0.02	-0.27
Children	0.26	-0.40	0.31	0.83
Percent of Variance	0.14		0.12	
Redundancy	0.02		0.01	
SET 2				
Job Satisfaction	-0.63	-1.18	0.77	0.26
Emotional Ex.	-0.09	-1.00	-0.98	-0.85
Personal Ac.	-0.49	-0.35	0.19	-0.17
Percent of Variance	0.21		0.53	
Redundancy	0.02		0.02	
Canonical Correlations	0.33		0.21	



Discussion, Conclusion, and Recommendations

The purpose of the present study was to investigate Turkish elementary science teachers' occupational well-being and the influence of some contextual and demographic factors on their level of emotional exhaustion, personal accomplishment, and job satisfaction. Firstly, mean values concerning emotional exhaustion, personal accomplishment, and job satisfaction revealed that teachers have low level of emotional exhaustion and high level of personal accomplishment and job satisfaction. This finding supports the findings of other studies which stated that burnout level of Turkish teachers was low (Akkuş İspir, 2010; Polat et al., 2009). Therefore, it can be concluded that Turkish elementary science teachers experience high level of occupational well-being. Even this finding is promising for our educational system, it is required to find out the effective factors in the enhancement of teacher's occupational well-being to increase this level and improve the positive effect of teachers on students. Accordingly, considering the second research questions seems important.

In order to answer the second research question which was stated for examining the factors that result in teachers' experiencing high job satisfaction and low burnout, a canonical correlation analysis was performed between an occupational well-being variables set and a demographical and context variables set. The first significant pair of canonical variates showed that teaching experience had highest loading indicating that higher years of teaching experience was associated with higher level of job satisfaction and personal accomplishment. This was an expected finding; because, while teachers' experience increases, their knowledge and teaching skills increase simultaneously. They also gained experience about how to cope with obstacles, which, in turn, may cause developing more positive attitudes toward teaching and thinking that they can be more successful in teaching. Similarly, in a study with music teachers, Otacıoğlu (2008) found that as teachers' experience increased, their burnout level decreased. There are some studies in the literature partly consistent with the current findings: For example, Sarı (2004) found that while teaching experience was positively associated with personal accomplishment, no such relationship was found with job satisfaction. In another study, Demirel et al. (2005) examined the difference in emotional exhaustion and personal accomplishment between the teachers whose years of teaching experience was less than 10 years and teachers whose experience was higher than 10 years, and their findings suggested that teaching experience makes no difference in personal accomplishment and emotional exhaustion. On the other hand, while Gürsel, Sümbül and Sarı (2002) found less job satisfaction in more experienced teachers than in less experienced teachers, some other studies found no significant relationship between job satisfaction and teaching experience (Can, 2006; Taşdan & Tiryaki 2008). As it can be understood from here, in Turkey, studies on the relation of experience to burnout and job satisfaction yielded mixed results. In the present study, since the focus was only elementary science teachers, these findings are important for science education. Science teachers have some obstacles when teaching such as teaching students with low motivation, lack of science teaching equipment in schools, and teaching difficult science subjects, that increase their stress level when teaching science (Soyibo, 1994). Facing with these kind of difficulties at the beginning of the work life may make inexperienced science teachers to experience burnout and by gaining experience, they may find the ways to cope with them and use more appropriate strategies.

Concerning the research examining the gender difference in elementary and secondary school teachers' occupational well-being, studies produced mixed results (Byrne, 1999). While some studies reported higher level of personal accomplishment for males (Kayabaşı, 2008), some studies didn't find any difference for males and females on personal accomplishment dimension of burnout (Akten, 2007; Telef, 2011). Additionally, some studies found no significant effect of gender on teachers' job satisfaction (Can, 2006; Taşdan & Tiryaki 2008; Telef, 2011). Findings of this study showed that female science teachers feel more successful in their job and experience higher job satisfaction than males. Female teachers can set more positive relationships with their students than male teachers (Spilt, Koomen, & Jak, 2012) and this can be one of the reasons of this situation. Because, teachers who can set more positive relationships with their students are more motivated to job, like the workplace, and feel more personal accomplishment (Grayson & Alvarez, 2008).

This study also showed that teacher graduated from faculty of arts and science are likely to higher level of job satisfaction and personal accomplishment than teachers graduated from faculties of education. Similarly, in a study with elementary school teachers, Gündüz (2005), it was found that teachers graduated from faculty of arts and science feel higher level of personal accomplishment than teachers graduated from faculty of education. On the other hand, there are some studies in which no significant differences were found between the graduated faculty types for job satisfaction (Taşdan & Tiryaki, 2008) and for subdimensions of burnout (Kayabaşı, 2008). In Turkey, the percentage of the inservice teachers graduated from faculty of arts and science is different for different branches. There are studies showing that teachers' attitudes toward teaching profession change depending on the teaching area (Eraslan & Çakıcı, 2011). Therefore, when studying on teachers perceptions about their job, taking graduated faculty type into account will contribute to draw more reliable conclusions about these associations. Since few studies examined the association between science teachers'

occupational well-being and graduated faculty types, it is thought that findings of this study will take attention to this gap and contribute to the literature. However, there is a need for more studies to find out the reasons of why teachers graduated from faculty of art feel better personal accomplishment and job satisfaction than teachers graduated from faculty of education. For example, teacher candidates graduated from faculty of art generally feel anxiety about being unemployed and being assigned as a teacher by government is an important possibility for them to get rid of this anxiety. Therefore, if they are able to be assigned as a teacher, thinking about worse situations such as being unemployed may cause to have more positive attitudes toward teaching profession, more pleasure and more satisfaction with job. Additionally, Atar (2014) analysed TIMSS 2011 data of Turkey and found that, even the result was not statistically significant, average science achievement score of the students who taught by science teachers graduated from faculty of science and art are higher than the students' who taught by science teachers graduated from faculty of education. This difference in students' science achievement may also cause higher level of feeling of personal accomplishment and job satisfaction of science teachers graduated from faculty of science and art.

While the second pair of canonical variate is considered, emotional exhaustion and job satisfaction are primarily related to class size and weekly course hours. The higher class size and higher weekly course hours are positively associated with emotional exhaustion and negatively associated with job satisfaction. Extensive workload is considered as one of the most important sources of teachers' stress (Kyriacou, 2001). Related literature showed that disruptive student behaviors were less likely take place in the classrooms with the smaller number of students (Ehrenberg, Brewer, Gamoran, & Willms, 2001). In these classes, teachers face less difficulties in classroom management, find more opportunities to find time for class discussions and activities (Ehrenberg vd., 2001; Taş, Sungur Vural, & Öztekin, 2014). Thus, these situations may cause teachers to have high job satisfaction and experience less burnout. On the other hand, extensive course hours mean extra workload for teachers and these make teachers to be had to invest more effort and energy. Therefore, teachers who have extensive course hours can be supposed to experience higher level of burnout (Friesen & Saros, 1989). Moreover, in the present study, teachers who have no child likely to experience lower level of emotional exhaustion and higher level of job satisfaction and marital status was not related with occupational well-being of teachers. In a study with Turkish language teachers, Bağcı and Karagül (2013) also did not found a significant difference in all subdimensions of burnout for marital status. Similarly, Kayabaşı (2008) found no significant difference between married and single elementary teachers in terms of emotional exhaustion and personal accomplishment. On the other hand, with elementary and high school teachers, Cemaloğlu and Şahin (2007), and, with elementary school teachers, Başol and Altay (2009) found significantly different emotional exhaustion but not personal accomplishment for different marital status. This indicated that marital status does not have an important role especially on personal accomplishment.

Overall, one can conclude that while some of the current findings are consistent with relevant literature, some of them shed light on the literature by some differences. At this point it is important to remind that studies in the related literature have some contextual differences compared to the current study such as teaching area, teaching level, and location. In order to be able to make more valid comparisons, more studies are needed especially focusing on elementary science teachers' occupational well-being in Turkey because; level of burnout is significantly related to the teaching area (Telef, 2011) and level (Haberman, 2004). Therefore, it can be reasonable to argue that science teachers have different occupational well-being profile than other teachers. Conducting more comparative studies including teachers from different areas will provide better evidence to support this argumentation.

In order to reach desired student learning outcomes, it is important to consider teachers' job related feelings. Therefore, considering all findings of this study together, this study has some implications. Firstly, regarding the findings of the first research question, it is seen that Turkish elementary science teachers' occupational well-being is in a good level. However, teachers' occupational well-being can be enhanced by investigating the more variables which are potential to contribute teachers' burnout and job satisfaction. It should be kept in mind that since teachers have important roles in students' learning: any improvement in teachers' occupational well-being, in turn, increases students' gainings. Although there are several variables that influence teachers' occupational well-being, only a few of them were in the scope of this study. Therefore, considering the findings of the second research question, improving working conditions by decreasing student number in each classroom and teachers' weekly course hours will be beneficial to reach educational goals. Younger teachers less satisfied with job and they reported lower level of personal accomplishment than experienced teachers. Additionally, elementary teachers who have child(ren) have extra responsibilities at home and this situation negatively affect their occupational well-being. More importance should be given to in-service teacher education programs focusing on strategies for coping with burnout to enhance occupational well-being of younger teachers and teachers who have child(ren). On the other hand, the reason why teachers graduated from arts and science faculties have higher job satisfaction and personal accomplishment should be investigated. This may require some regulations in pre-service and in-service science teacher training. Lastly, this study included only a limited number of demographic and contextual variables. Therefore, investigation of science teachers' occupational well-being by considering different variables is expected to contribute to the related literature and guide educational practices.

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