



Physical Activity Determinants of Female Teachers in Rasht County, Iran; Applying the Social Cognitive Theory

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ABSTRACT

Aims Inactivity among Iranian women is higher than in Iranian men. Since teachers are exposed to occupational damages, it is necessary to consider physical activity in teachers. The Social-Cognitive Theory (SCT) is a useful framework for understanding physical activity behavior. Therefore, the present research was aimed to determine physical activity determinants in female teachers based on SCT.

Instrument & Methods This analytic-cross sectional study was performed on 612 female schoolteachers of all educational levels of urban and rural areas of Rasht County using multi-stage random sampling in the 2019- 2020 academic years. The data collection instruments included demographic information, International Physical Activity Questionnaire- Short Form, and Social Cognitive Theory Questionnaire. In order to analyze the data, I used Independent Samples t-test, Analysis of Variance, Spearman Correlation Coefficient, and Multiple Linear Regression tests in SPSS 21 software.

Findings The age average of the teachers was 40.25±7.65. Of the total, 331 teachers (54.1%) had light physical activity (0-599 MET minutes/week). It observed the most direct correlation between self-efficacy (r=0.439) and exercise planning (r=0.513) with physical activity behavior. Constructs of exercise Planning (B=0.34, p=0.001) and Self-Efficacy (B=0.14, p=0.003) were the most significant predictors of physical activity and accounted for 17% and 12% of the variance, respectively.

Conclusions Constructs of exercise Planning and Self-Efficacy were the most important predictors of physical activity that can be used in designing interventions to promote physical activity in teachers.

Keywords Social Cognitive Theory; Physical activity; School Teachers; Health Education

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Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure. Adults aged 18-64 years should have at least 150 minutes of moderate aerobic physical activity per week or at least 75 minutes of intense aerobic activity per week or an equivalent combination of moderate to severe aerobic activity that should last at least 10 minutes continuously [1].

Physical activity is one of the important aspects of lifestyle that effectively prevents cardiovascular diseases, stroke, hypertension, breast cancer, colon, type 2 diabetes, obesity, and osteoporosis and improves mental health [2]. Women with regular physical activity are 0.3 to 1.3 years longer than women who are not physically active [3]. Studies have shown that 48.6% of Iranian women have little physical activity [4]. The rate of inactivity in Iranian women is much higher than in Iranian men. In a study conducted in Isfahan, 49.4% of women had adequate physical activity (150 minutes per week with moderate intensity) [5].

The rate of physical activity in women decreases during the transition from school to employment period. The teaching profession is associated with high stress and physical complaints, low job satisfaction, and early retirement [6]. Teachers play a vital role in educating people in society and are a key factor for fundamental and effective reform in education [7]. Therefore, physical activity is very important in this job group. Previous studies about teachers' leisure physical activity have shown a positive relationship between physical activity and mental and physical health. Physically active teachers can encourage their students to engage in physical activity. They should promote a healthy lifestyle, especially physical activity [6, 8].

Behavior change can be created in people using health education, which focuses on every health activity. Selecting the proper model is the first step in the educational planning process, which starts the program in the right direction and keeps it moving in the right direction. One of the theoretical frameworks for predicting physical activity behavior is Social Cognitive Theory (SCT). This theory assumes that human behavior can be explained as a three-way causality, including behavioral, environmental, and individual factors. The unique interaction between these three dimensions leads to behavior change [9]. In SCT-based studies [10, 11], physical activity has been explained based on the constructs of outcome expectations, perception of the environment (situational perception), social support of family and friends, self-efficacy, goal setting, and schedule.

Outcome expectations, including predicting possible consequences resulting from involvement in the mentioned behavior, such as the positive and negative consequences of the desired behavior and situational perception, refer to how people perceive

and interpret their surroundings. Environmental factors include the physical or social conditions around a person that affect a person's life (parental support, peer influence, etc.). Social support means receiving help by connecting with others. Self-efficacy is the confidence that a person has in their ability to pursue a behavior. Goal setting or self-control refers to setting some goals and creating programs to perform selected behaviors [12]. In the study of Nemat Elahi and Anderson on women, this theory explained 29 and 46% of the variance of physical activity behavior, respectively, and self-regulation was the strongest predictor of behavior [5, 13].

This study aimed to determine the predictors of physical activity behavior designed based on cognitive-social theory in female teachers, considering the statistics and complications of lack of physical activity in women teachers, especially in Gilan province and Rasht city and the need to explain the factors affecting it based on the framework of cognitive-social theory and lack of related research in the community.

Instrument and Methods

This cross-sectional study was carried out between 612 female teachers of all urban and rural schools in Rasht in 2019. The sample size was calculated based on the results of the study of Danieli *et al.* in working women in 2012 [14] and an estimate of 28% of active physical activity and considering the accuracy of 4% and 95% confidence level, 485 people were calculated. Considering the loss of information in 5% of the samples and the effect of the design equal to 1.5, the final sample size was determined to be 612 people, which were selected by a multi-stage random sampling method. First, each of the seven districts of Rasht city, including Rasht (districts 1 and 2), Khomem, Khoshkbijar, Sangar, Kuchesfahan, and Vesht Nasha, were considered as clusters (districts). Then, the number of teachers in each ward was allocated in proportion to the total population of teachers in that ward. Urban and rural schools were then considered as classes to select teachers.

In the urban class, schools were selected from the list of education schools randomly in 4 geographical areas (north, south, east, and west) separately in two sub-categories, governmental and non-governmental. In the rural class, in large sections based on geographical area and in small sections based on the number of schools, approximately 2 to 3 schools were randomly selected.

Incomplete filling in of the questionnaire, pregnancy, breastfeeding, getting sick (severe cardiovascular disease under treatment with limited mobility, joint diseases under treatment with limited mobility, diabetes under treatment, etc.) and the unwillingness to continue participating in the study were exclusion criteria of this study (Figure 1).

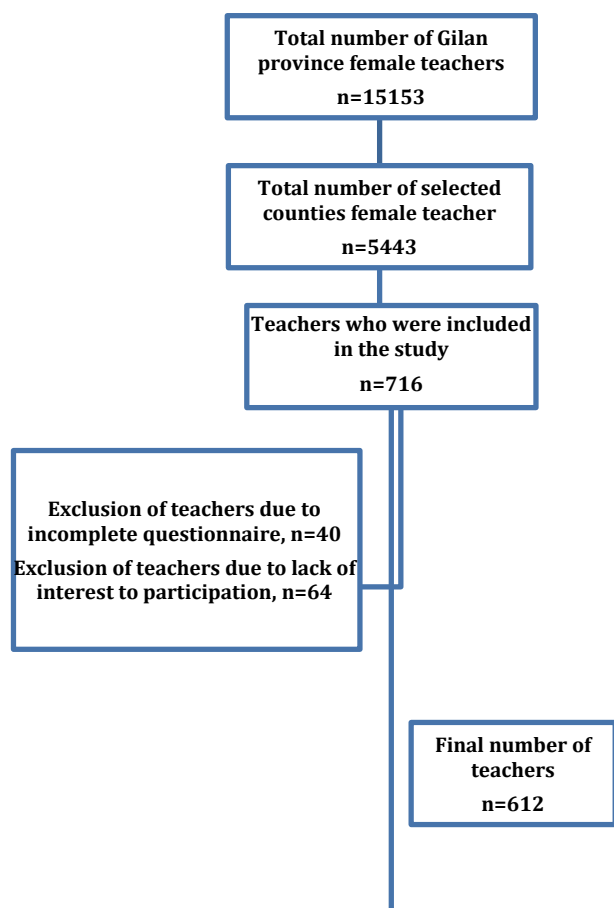


Figure 1) Entering of the population to study

The data collection tool was a questionnaire consisting of three parts. The first part was demographic and contextual information, including age, education level, marital status, spouse's occupation, number of children, number of children under five years old, place of residence, place of work, and monthly household income. The second part was related to physical activity behavior, which used the International Physical Activity Questionnaire-Short Form (IPAQ) [15, 16]. Physical activity was assessed in three levels: intense, moderate, walking duration the past week, and sitting per day, in terms of met-minute/week. Metabolic Equivalent of Task (MET) is a unit used to estimate energy consumption. One met is approximately equal to the amount of energy consumption at rest in a person [1]. Intense physical activity questions included heavy lifting, digging, aerobic exercise, fast cycling, football, and running. Moderate physical activity included carrying light loads, moderate-speed cycling or volleyball, and questions about walking included walking to workplace, home, and from place to place. Activities that lasted at least 10 minutes and were continuous were calculated. The internal consistency of the questionnaire was confirmed by measuring Cronbach's alpha coefficient of 0.76 in external studies [16] and correlation coefficient of 0.74 in internal studies [17]. Its reliability was evaluated using

the test-retest method on ten samples through the Spearman correlation coefficient. Correlation coefficients for intense and moderate physical activity, walking, and sitting activity included 0.75, 0.81, 0.87, and 0.79, respectively. In this questionnaire, 3.3, 4, and 8 MET were considered for walking, moderate physical activity, and intense physical activity, respectively. To calculate the total amount of physical activity per week, the amount of walking (day×minutes×MET) with moderate physical activity (day×minutes×MET) and the amount of intense physical activity (day×minutes×MET) were added together during the week. To scoring the questionnaire, a specially designed Excel file was used [18]. The third part, the Cognitive-Social Theory Questionnaire, was retrieved from the questionnaires available in studies abroad and inside of Iran [11, 19-23]. Scales extracted from foreign articles were translated into Persian language using the translation-retranslation method. The content validity of the questionnaire was confirmed by a panel of faculty experts consisting of 8 specialists in health education and health promotion, two specialists in sports sciences, and one epidemiologist. The reliability of the questionnaire was evaluated using Cronbach's alpha coefficient through filling the questionnaire by 20 teachers (similar to the statistical population). In addition, the face validity of the questionnaire was assessed during a survey of 20 teachers and announcing ambiguities by them. The questionnaire was finally reviewed and modified by the research team. Structural items of positive and negative outcome expectations, the construct of social support of family and friends, the construct of perception of the environment, self-efficacy construct and goal setting and sports planning constructs were retrieved from the study of Marcus *et al.* [19], Salis *et al.* [23], Salens and Indi [22], Horn *et al.* [21] and Ronik *et al.* [11]. Content validity ratio and index were CVR=0.81 and CVI=0.95 for SCT constructs. Positive outcome expectations included 11 items with Cronbach's alpha of 0.81; Negative outcome expectations included four items with Cronbach's alpha of 0.72. The scoring method for outcome expectations was a 5-point Likert scale with a range of strongly disagree (score 1) to strongly agree (score 5). Family social support had eight items (for example, family members exercise with me) and Cronbach's alpha of 0.83. Social support for friends with five items (for example, my friends encourage me to continue the exercise program) and Cronbach's alpha of 0.88. Family social support had eight items (for example, family members exercise with me) with Cronbach's alpha 0.83. Social support of friends had five items (for example, my friends encourage me to continue the exercise program) and Cronbach's alpha 0.88. Self-efficacy had seven items (for example, I exercise even if I am very tired) and Cronbach's alpha of 0.93. Setting sports goals had seven items (for

example, I set most of my sports goals) and Cronbach's alpha of 0.83. Finally, perception of the environment had six items (for example, It is possible to walk from my home to my workplace for at least 10 minutes) with Cronbach's alpha 0.60. the items were scored by 5-points Likert scale from none (score 1) to very high (score 5). The scoring of one of the structural items of "family social support" and two items of the structural item of "sports planning" was calculated through reverse mood.

After receiving a Guilan University of Medical Sciences license and the Rasht Education Department, the researcher referred to the schools in coordination. The researcher went to the schools in coordination and, after obtaining the informed written consent of the teachers, provided the necessary explanations regarding the study objectives and how to fill the questionnaire. The questionnaire was then completed by the teachers during 30-45 minutes by self-fulfilling.

Data were described using mean and standard deviation indices and intermediate-range for quantitative and absolute and relative frequencies for qualitative variables. The normality of the data was confirmed using the Kolmogorov-Smirnov test. In case of failure to establish a normal assumption, data modification was performed using the logarithm of the original data. Independent chi-square and T-tests and analysis of variance were used to compare physical activity scores. THE Spearman coefficient was used to determine the correlation between the studied variables. The predictive relationship of variables with physical activity behavior was investigated by a multivariate linear regression test. Data were analyzed using SPSS 21 software with a significance level of less than 0.05.

Findings

The mean age of 612 participants was 40.25±7.65 years. 60.9% (n=373) of teachers had a bachelor's degree and 81.4% (n=498) were married. 55.1% (n=337) of teachers had an employee spouse, and 37.3% (n=228) of them had two children. Only 13.6% (n=83) of teachers had children under five years old. 48% (298 people) of teachers had a monthly household income of 6,000,000-34,000,000 Tomans (Table 1).

The median and interquartile range of physical activity behavior (1251-198) was 637.5. The physical activity was light (0-599 MET-minutes/week) in

54.1% (n=331), moderate (1500-600MET-minutes/week) in 32.5% (n=199), and intense (3000-1500MET-minutes/week) in 13.4% (n=82) of teachers.

There was a significant correlation between SCT constructs. Family social support (r=0.443) and self-efficacy (r=0.693) had the highest direct correlation with setting sports goals, respectively. Inversely negative outcome expectations (r=-0.479), self-efficacy (r=0.695) and sports goal-setting (r=0.722) were directly correlated with sports planning. Also, self-efficacy (r=0.439) and sports planning (r=0.513) showed the highest direct correlation with physical activity behavior (Table 2).

Simultaneous regression model (Enter), including SCT constructs and contextual variables, predicted 20% of behavior scatter (R²=20%). The variables of education level, marital status, self-efficacy structures, and sports planning showed a significant relationship with physical activity behavior. Per unit increase in logarithm of sports planning and self-efficacy, the average logarithm of physical activity score increased by 2.17 and 0.81 units, respectively (Table 3).

Table 1) Demographic charecteristics of teachers (n=612)

Characteristics	Number	Percent	
Age	20-35 years	166	27.1
	36-45 years	281	45.9
	46-60 years	165	27
Educational level	Diploma and associate degree	43	7.1
	Bachelor	373	60.9
	MSc and upper	196	32
Marital status	Married	498	81.4
	Single	94	15.3
	Divorced and widow	20	3.3
Husband job	Clerk	337	55.1
	Manual Worker	10	1.6
	Freelance	152	24.8
Number of children	No children	173	28.3
	One child	176	28.8
	Two children	228	37.2
	Three children	35	5.7
Number of under five years children	No child under five years	529	86.4
	Having a child under five years	83	13.6
Living Location	City	551	90
	Village	61	10
Location of work	City	407	66.5
	Village	205	33.5
Monthly income	Under 34000000 Rials	189	30/9
	34000000-60000000 Rials	298	48.7
	Upper 60000000 Rials	125	20.4

Table 2) Correlation between Social cognitive theory constructs and physical activity (p<0.05)

Constructs	9	8	7	6	5	4	3	2	1
1. Positive outcome expectancy	0.097	0.293	0.297	0.130	0.398	0.205	0.245	-0.369	1
2. Negative outcome expectancy	-0.295	-0.479	-0.372	-0.101	-0.459	-0.200	-0.241	1	
3. Family social support	0.222	0.382	0.443	0.209	0.439	0.382	1		
4. Friends social support	0.215	0.381	0.365	0.160	0.391	1			
5. self-efficacy	0.439	0.695	0.693	0.218	1				
6. Perception of environment	0.130	0.202	0.253	1					
7. Regulation of exercise goal	0.370	0.722	1						
8. Exercise planning	0.513	1							
9. Physical activity	1								

Table 3) Moderated relation of Social cognitive theory constructs and demographic variables with physical activity using multivariate regression models

Variables	B	SE	t-value	p-value	Confidence interval 95%	
					upper	under
Logarithm						
Positive outcome expectancy score	0.11	0.66	0.18	0.850	1.41	-1.17
Negative outcome expectancy score	-0.06	0.21	-0.29	0.760	0.35	-0.48
Family social support score	0.02	0.38	0.06	0.950	0.77	-0.73
Friends' social support score	0.18	0.21	0.87	0.380	0.60	-0.23
Self-efficacy score	0.81	0.37	2.14	0.030	1.55	0.06
Perception of environment score	0.20	0.29	0.69	0.490	0.77	-0.37
Regulation of exercise goal score	-0.31	0.32	-0.98	0.320	0.31	-0.94
Logarithm of exercise planning score	2.17	0.38	5.61	0.001	2.93	1.41
Age	-0.002	0.005	-0.45	0.650	0.008	-0.013
Educational level						
Diploma and associate degree	Reference					
Bachelor	0.29	0.14	1.99	0.040	0.572	0.003
MSc and upper	0.28	0.15	1.90	0.050	0.588	-0.009
Number of children						
No children	Reference					
1 child	-0.09	0.12	-0.76	0.440	0.14	-0.33
Two children and more	-0.07	0.12	-0.60	0.540	0.17	-0.32
Marital status						
Married	Reference					
Single	-0.06	0.13	-0.48	0.631	0.20	-0.33
Divorced and widow	0.41	0.20	1.99	0.047	0.82	0.004
Living Location						
City	Reference					
Village	0.11	0.13	0.83	0.400	0.37	-0.15
Location of work						
City	Reference					
Village	0.12	0.08	1.52	0.120	0.28	-0.03

Dependent variable: Logarithm of Physical activity score; Regression model by contemporary entering of variable

The final model with stepwise method consisted of two constructs of sports planning and self-efficacy, with the coefficient of determination of this model was 18%. The final model with the Stepwise method included two structures of sports planning and self-efficacy. The coefficient of determination of this model was 18%. The sports planning construct with 17% (p=0.001 and B=2.09) and the self-efficacy construct with 12% (p=0.007 and B=0.899) had the highest predictive power.

Discussion

The present study results showed that among the SCT constructs, the structure of sports planning and self-efficacy were the most important predictors of physical activity behavior in teachers. On the other hand, the physical activity was light (0-599 MET-minutes/week) in 54.1% (n=331), moderate (1500-600MET-minutes/week) in 32.5% (n=199), and intense (3000-1500MET-minutes/week) in 13.4% (n=82) of teachers.

In terms of activity level, the present study results are in accordance with the results of the studies of Danaei et al. [24], Mazloumi et al. [25]. However, according to Danieli et al. [14] and Mahmoudi et al. [26], it is not. This difference can be due to the presence of both sexes in the Mahmoudi study, as well as differences in the type of occupation and tool for measuring physical activity behavior. For example, the long-form of IPAQ was used in the study of Mahmoudi, and the standard HPLLP (Health Promotion LifeStyle Profile) questionnaire was used in the study of

Daniali et al., while in the present study, the physical activity of female teachers was assessed using the short form of IPAQ. Given that teachers' activities are performed in a standing position, and this position is considered as a low-intensity activity in terms of intensity, so they are not enough activity to maintain their healthy [27], and these can be reasons for the differences between the results of this study and some studies.

The median and interquartile range of physical activity behavior score (1251-198) was 637.5, which is close to the results of the study of Nemat Elahi et al. [5]. Thus, there was a significant direct and strong correlation between sports planning and physical activity behavior, which is consistent with the results of studies by Nemat Elahi et al. [5] and Peyman et al. [28], whereas its different from the results of studies by Ozinski et al. [29], and Zhou et al. [30]. Differences in age group and physical condition of individuals, the presence of both genders, and climatic conditions can be reasons for the differences between the results of the mentioned studies and the present study.

There was a weak correlation between social support (friends and family) and physical activity behavior, which is similar to the results of the studies of Nemat Elahi et al. [5], Patterson et al. [31], whomever it is slightly different from the results of the study of Peyman et al. [28]. This difference may be due to the differences between the subjects so that in the study of Peyman et al., the subjects were diabetic and chronically ill people who needed the support of others about their disease.

There was a moderate correlation between self-efficacy and physical activity behavior, which is similar to the results of studies by Nemat Elahi *et al.* and [5], Mahmoudi *et al.* [26], but it is different from the results of Teymouri *et al.* [32], Shirvani *et al.* [33]. This difference may be due to the presence of female adolescents in these studies as the subject; because in adolescence, factors such as weight loss and fitness increase physical activity.

The most important predictor of physical activity behavior was sports planning, which is consistent with the results obtained from the studies of Peyman *et al.* [28], Nemat Elahi *et al.* [5], and Anderson *et al.* [13], but was different from the results of the study of Ibo *et al.* [34]. This difference can be due to differences in culture, indigenous and climatic conditions, and the presence of both genders in the study.

The percentage of the predicted variance of physical activity by SCT constructs was 29% in Nemat Elahi *et al.* [5] and 20% in Mahmoudi *et al.* [26], similar to the results of the present study. The result is in accordance with Mirkarimi *et al.* [10], as the SCT constructs predicted 32% of the variance of physical activity. This difference can be due to the heterogeneity of the population in terms of education level, the role of cultural, climatic, and occupational factors in the study compared to the present study. In Mahmoudi *et al.* [26] and the study of Mirkarimi *et al.* [10], the construct of self-efficacy was the most important predictor of physical activity behavior. In contrast, the construct of sport planning was the most important predictor in this study. Therefore, the difference between these studies with the present study is the difference in the target population in terms of demographic factors, level of education, age group, occupation, and the presence of both genders in some of the mentioned studies. The sports planning construct with 17%, and then the self-efficacy construct with 12% had the highest predictive power of behavior. SCT constructs and contextual variables were also able to predict 20% of changes in physical activity behavior. The final model was obtained by the stepwise method, including two structures of sports planning and self-efficacy with a coefficient of determination of 18%. Overall, the model was statistically acceptable and introduced the predictor ability of physical activity behavior by SCT constructs. The most important predictors of physical activity were sports planning, self-efficacy, education level, marital status, respectively.

The present study was conducted at the beginning of the academic year. Teachers have a heavy job responsibility, which is added to the responsibilities of the family. The training profession makes it difficult to manage time and energy for other activities due to its high working sensitivity. This makes it difficult for teachers, despite understanding the health consequences of physical activity, to plan regularly to perform regular work, family, and physical activity responsibilities due to barriers such

as lack of time. This makes it difficult for teachers to regular planning for simultaneous doing the job and family responsibilities and regular physical activity due to barriers such as lack of enough time. The mentioned occupation characteristics in the subjects can be one reason for the prediction of the two mentioned constructs regarding the variance of physical activity. Therefore, the design of educational intervention in the subjects should be done to promote these predictive variables to increase physical activity. Self-regulatory strategies can be used to improve planning. Self-regulatory strategies provide the basis for purposeful action. Based on that, people form their beliefs about what they can do and predict similar results for future action, and they aim to achieve them, and in order to take action, they plan a program that has a favorable outcome for them [12]. In this regard, it is possible to provide opportunities to setting goals, monitoring progress, and provide personal rewards. Behavioral change, the use of a believable role model, and encouragement of the audience can be used to improve self-efficacy.

In the present study, there was a significant predictive relationship between demographic variables, level of education, and marital status with physical activity score. So that the physical activity in the subjects with education level of bachelor increased by 0.29 compared to the physical activity of teachers with education level of diploma, which seems to be due to their greater awareness of the benefits of physical activity, which is different from the study of Peyman *et al.* [28], this difference may be due to differences in the level of education, age, and occupational conditions of the subjects in the present study with the mentioned study. Divorced and widowed women also tended to engage in more physical activity than married people to overcome difficult living conditions and psychological concerns resulting from divorce or loneliness.

The limitations of this study include its cross-sectional nature, self-reported data collection, and teachers' limited willingness to participate in research due to educational activities. Therefore, to reduce the limitations of self-report and attract more participation and assurance the confidentiality of information, the research objectives were stated for the subjects at the beginning. Then, the teachers were given explanations about completing the questionnaire accurately and honestly, optional mention of the name in the questionnaire, and collecting questionnaires in groups mood. Also, it was reminded that the study results would be presented to the Education Organization and the Health Network of Rasht city to plan interventions to promote teachers' physical activity.

Given that more than half of the teachers had light physical activity, educational intervention should be planned to promote physical activity with a focus on predictive constructs. Some methods can also help teachers facilitate planning for physical activity,

including allocating hours to regular physical activity in weekly planning, walking short distances instead of using a vehicle, and doing physical activity at every opportunity. It is also suggested that the Department of Education encourage teachers to exercise during the week by allocating sports hours for teachers during the academic year and equipping schools with sports facilities and equipment. Also, it suggested that the Department of Education use health education forces to encourage teachers to enhance self-efficacy and sports planning.

Conclusion

Sports planning is a part of self-regulation, and self-efficacy were important factors in predicting physical activity behavior, and these constructs can be used in designing interventions to promote physical activity in teachers in Rasht city.

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