



# Relationship Between Secure and Insecure Attachment Style with Physician Empathy Among Medical Students: A Cross-sectional Study in Iran

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## Abstract

**Background:** Physician empathy is one of the fundamental factors involved in patient care and it can enhance the therapeutic effects of patient-clinician relationships. Attachment is defined as the tendency of human beings to make strong affectional bonds with some specific people.

**Objectives:** This study aimed to examine the possible relationship between secure and insecure attachment style with physician empathy among medical students.

**Methods:** A cross-sectional study was conducted on 268 medical students and residents at Mazandaran University of Medical Sciences, Iran in 2015. All participants voluntarily participated in this study and an informed consent was obtained. Data analysis was done through completing two questionnaires, including the Jefferson Scale of Physician Empathy-Health Professionals Version (JSPE-HP) and the Revised Adult Attachment Scale (RAAS). Data was analyzed using Pearson correlation coefficient and stepwise regression analysis and analyzed in SPSS (v. 18).

**Results:** The highest frequency (n = 137; 51%) was related to individuals in the age range of 21 - 25 years. The empathy score of all students was 99.99. Among 268 participants, 76 (28.4%) and 192 (71.6%) students represented secure and insecure attachment styles, respectively. Married students had higher empathy scores than single students (P = 0.056). No statistically significant difference was found in the mean empathy scores by gender (P = 0.305) and different years of studying (P = 0.883). The mean  $\pm$  standard deviation of empathy score in psychiatry residents was  $113.4 \pm 16.24$ , which was higher than the residents of other fields. Also, our results revealed no significant difference between the empathy scores in individuals with secure and insecure attachment styles (P = 0.945; 95% CI: -3.883 - 3.620).

**Conclusions:** Evaluating empathy in the educational courses of medical students, as future physicians, can offer valuable guidelines to improve the mental health of students and help them have a good relationship with patients.

**Keywords:** Attachment Style, Empathy, Relationship, Students

## 1. Background

Empathy is the ability to put oneself in another's place to understand their experiences and feelings. It is considered an essential element of doctor-patient relationships, which are composed of affective and cognitive components. Empathic doctor-patient relationships can encourage patients to share more information about their symptoms and concerns (1), increase the doctor's chance of

making an accurate diagnosis, promote the patients' satisfaction and compatibility, and improve their lifestyle and quality of life (2).

One study demonstrated that the level of empathy among medical students depends on their field of study, interests, duration of education, and personal character (3). The empathy scores of female students were often higher than males (4). One study showed that women scored higher than men in terms of affective empathy

during their six-year medical training program. While affective empathy in men slightly declined throughout the training period, no such changes were seen in women. In addition, no variations were observed in the cognitive empathy of men and women (5).

Attachment is considered as the method employed to conceptualize and measure the quality of relationships between the two sides (6). Attachment is the affectionate bond between two individuals, which generates a sense of psychological safety (7). A noteworthy development in the field of contemporary psychology is Bowlby's attachment theory. Bowlby described attachment as a basic human need, which has an adaptation value that directs an individual to maintain closeness and proximity with important people in their life [cited in (8)]. Bowlby recognized three attachment styles: secure, avoidant, and ambivalent. Secure attachment relates to the characteristics of positive communications such as intimacy and pleasure; the avoidant attachment style is associated with lower levels of intimacy and commitment; and the ambivalent attachment style refers to the enthusiasm and preoccupation with low-satisfaction relationships [cited in (9)]. However, while people with an avoidant attachment style can establish intimate relationships with others, it is usually in a difficult manner, and they rely heavily on themselves (10). According to attachment theory, the activity of the attachment system is not limited to childhood; other affectional bonds such as friendship, marriage, and family relationships remain active throughout life (11). Individuals with a secure attachment style have positive views toward themselves and others, while those with an insecure attachment style experience negative attitudes (11), suggesting that a relationship may exist between attachment styles and empathy. Also, according to a study by Hojat et al. on the relationship between empathy and personality, empathy may be associated with attachment styles (3). In this respect, a study conducted on Iranian nursing students in 2012 indicated a positive relationship between a secure attachment style and empathy (12). In a research study in 2005, Dattilo argued that doctors with higher avoidant attachment style might have few qualifications, and a more secure attachment style was reported by doctors with higher levels of empathy (10). Different attachment styles of medical students as a factor that can affect their empathy have received little consideration.

## 2. Objectives

Given the limited studies conducted on empathy and the relationship between attachment style and empathy among medical students in Iran, we performed this study to investigate this issue.

## 3. Methods

This cross-sectional study was conducted on 268 medical students and residents at Mazandaran University of Medical Sciences, Iran from January 2015 to June 2015. The statistical population included 433 individuals (188 residents and 245 interns). Inclusion criteria were all the interns and residents who agreed to participate in this study by completing the questionnaires. Incomplete questionnaires were excluded from the study.

### 3.1. Measures

Three self-report questionnaires were used in this study: (1) a demographic questionnaire; (2) the Jefferson Scale of Physician Empathy-Health Professionals Version (JSPE-HP); and (3) the Revised Adult Attachment Scale (RAAS).

#### 3.1.1. Demographic Questionnaire

A researcher-made questionnaire was used to collect demographic information, including age, gender, marital status, years of education, field of study, family's place of residence, student's place of residence, nativity status, level of income, level of education, history of psychiatric disorders, parental death in childhood and adolescence, level of familiarity with empathy, and interest in the field of study.

#### 3.1.2. Jefferson Scale of Physician Empathy-Health Professionals Version

The JSPE-HP consisted of 20 items asking the respondents to answer questions or statements related to empathy with patients. The responses were based on a five-point Likert scale ranging from 1 (agree) to 5 (strongly disagree). Thus, the respondents' total scores ranged from 100 to 140, with higher scores indicating higher levels of empathy with patients. Cronbach's alpha coefficient was used for the reliability of this questionnaire, with a minimum acceptable level of 0.7. The reliability and validity of the JSPE-HP in an Iranian study was good and Cronbach's alpha coefficient was equal to 0.83 (2, 13).

#### 3.1.3. Revised Adult Attachment Scale

The RAAS, which was developed by Collins and Reid in 1990 and revised in 1996, is based on adult attachment theory and comprises 18 statements to which the respondents rate their agreement or disagreement on a five-point Likert scale. The three dimensions which are assessed by this scale include dependence (representing the degree of reliance on others), closeness (the level of intimacy and emotional closeness to others), and anxiety (the degree of anxiety for being rejected and judged). Six statements

were assigned to each of the closeness (1, 7, 9, 13, 15, 17), dependent (3, 6, 8, 14, 16, 18), and anxiety (2, 4, 5, 10, 12, 11) subscales. To obtain the scores for each subscale, the related scores were added and divided into the number of statements (3). Several statements, including 9, 15, 17, 3, 8, 16, 18, and 2 were rated in reverse order. Based on their results, the respondents were placed in one of the four groups of attachment styles: (1) secure, (2) preoccupied, (3) dismissing, or (4) fearful. Individuals with closeness scores higher than average ( $> 3$ ) and anxiety scores lower than average ( $3 \geq$ ) were considered to have a secure attachment style. Respondents whose anxiety and closeness attachment scores were higher than average ( $> 3$ ) were placed in the preoccupied attachment style group, and those with lower than average ( $3 \geq$ ) scores for the three sub-scales were placed in the dismissing attachment style group. Individuals with lower than average ( $3 \geq$ ) closeness-attachment scores and higher than average ( $> 3$ ) anxiety scores were placed in the fearful attachment style group. The closeness-attachment subscale was an average of closeness and attachment. The following scale was closely related to the closeness-attachment average. Test-retest reliability coefficients for the sub-scales of closeness, attachment, and anxiety were 0.68, 0.71, and 0.52, respectively. Collins and Reid revealed that the subscales of closeness, attachment, and anxiety were stable for a period of two months, and even eight months (5). Among Iranians, the highest (0.74) and lowest (0.28) reliability scores were obtained for the anxiety and attachment dimensions, respectively. In addition, the reliability score of the closeness dimension was moderate (0.52), which was similar to the results of the test re-test method (14).

### 3.2. Statistical Analysis

The collected data were entered into SPSS (v. 18) software. To describe the quantitative data related to the variables of age and education, means and standard deviations were calculated. Percentages and frequency distributions were employed to describe the qualitative variables (marital status, gender, family's place of residence, student's place of residence, nativity status, level of income, level of education, history of psychiatric disorders, parental death in childhood and adolescence, and interest in the field of study), the attachment style, and the classification of different residency disciplines. To compare the empathy scores in binary variables (gender, level of education, place of residence, family's place of residence, nativity status, history of psychiatric disorders, marital status, history of taking empathy training workshops, history of parental death in childhood and adolescence, and attachment styles), a *t*-test was conducted, with a 0.05 significance level. Analysis of variance (ANOVA) test was em-

ployed to compare empathy scores in multiple variables (age, family's monthly income levels, interest in the field of study, drug abuse, attachment style, and groups of residency disciplines), with a 0.05 significance level. To measure the linear relationship between the means of the empathy scores and the subscales of the attachment styles, the Pearson correlation coefficient was used.

### 3.3. Ethical Considerations

A written informed consent was signed by all students. Also, the study was approved by the Ethics Committee of Mazandaran University of Medical Sciences (IR.MAZUMS.REC.1397.011).

## 4. Results

### 4.1. Study Sample

Of the 311 participants who returned the questionnaires, 113 were residents and 198 were interns. Of those, 43 respondents (17 residents and 26 interns) were excluded from the study due to errors in the completion of the questionnaires, leaving 268 questionnaires (87 residents and 181 interns) for analysis.

### 4.2. Descriptive Statistics

Table 1 presents the demographic characteristics and empathy scores of the participants. The majority of participants (95.9%) had no history of psychiatric illnesses. Only 27 (10%) individuals had participated in empathy training workshops previously. Most of the participants (94.9%) were strongly interested in their fields and 1.9% expressed disinterest in their disciplines.

The students' mean  $\pm$  standard deviation of empathy score was  $99.99 \pm 14.03$ . The highest and lowest scores of empathy were 63 and 133, respectively. While the interns' mean  $\pm$  standard deviation of empathy score was  $99.72 \pm 113.41$ , it was  $100.55 \pm 15.30$  for the residents. No statistically significant difference was found in the mean empathy scores by different years of studying ( $P = 0.883$ ).

Evaluating 14 specialized fields showed that the highest level of empathy was seen in psychiatric residents with an average score of  $113.44 \pm 16.24$ . In the next places, there were residents of infectious diseases ( $112.33 \pm 3.21$ ), general surgery ( $106.29 \pm 18.17$ ), sports medicine ( $104.50 \pm 14.84$ ), radiology ( $103.17 \pm 18.06$ ), anesthesia ( $103 \pm 13.07$ ), internal medicine ( $101.75 \pm 11.087$ ), neurosurgery ( $100.33 \pm 6.65$ ), pathology ( $99 \pm 44.24$ ), pediatric ( $98 \pm 9.48$ ), gynecology and obstetrics ( $97.90 \pm 16.80$ ), cardiology ( $94.40 \pm 14.57$ ), orthopedics ( $91.33 \pm 27.39$ ), and emergency medicine ( $90.71 \pm 12.76$ ).

**Table 1.** The sociodemographic Characteristics of Participants and Empathy Scores

Demographic Characteristics and Group	No. (%)	Mean of Empathy	SD of Empathy
<b>Gender</b>			
Female	176 (65.7)	99.35	13.90
Male	92 (34.3)	101.21	14.27
<b>Age</b>			
21 - 25	137 (51.1)	98.61	13.40
26 - 30	59 (22)	102.74	13.36
31 - 35	47 (17.5)	98.81	14.33
36 - 40	18 (6.7)	102.28	16.26
41 - 45	7 (2.6)	105.86	21.21
<b>Marital status</b>			
Single	175 (67.5)	98.80	13.41
Married	87 (32.5)	102.37	14.91
<b>Educational levels</b>			
Medical students in clinical classes	87 (32.4)	99.72	13.41
Medical residents	181 (67.5)	100.55	15.30
<b>Family's place of residence</b>			
Village	12 (4.47)	103.13	10.02
City	256 (94)	99.79	14.24
<b>Students' nativity status</b>			
Yes	113 (14.2)	101.79	13.59
No	155 (57.8)	89.68	14.24

Table 2 shows the frequency (%) of the attachment styles. In this study, the insecure attachment

styles were predominant and 192 (71.6%) of the students represented an insecure attachment style. The frequency of secure attachment styles among all students was 76 (28.4%). The highest and lowest frequencies in insecure attachment styles were related to fearful 127 (47.4%) and dismissing 44 (16.4%), respectively. The majority 72 (82.8%) of residents were found to have insecure attachment style. The frequency of secure attachment styles in medical residents was 15 (17.2%).

The mean  $\pm$  standard deviation of empathy score ac-

cording to attachment styles was  $99.89 \pm 13.99$  for secure attachment styles and  $100.03 \pm 14.08$  for insecure attachment styles.

Table 3 illustrates the relationships between the mean empathy scores and attachment styles and other qualitative variables according to the *t*-test. No significant difference was found between the mean empathy scores of individuals with secure and insecure attachment styles ( $P = 0.945$ ). Considering the unequal variances, a significant difference was evident between the mean empathy scores of married and unmarried students ( $P = 0.056$ ), so that married students obtained higher scores.

Table 4 shows the relationship between the mean empathy scores and quantitative variables using ANOVA. No significant difference was found between the mean empathy scores and attachment styles ( $P = 0.743$ ,  $f = 0.414$ ).

The relationship between the mean score of empathy and sub-scales of attachment styles was investigated using Pearson correlation coefficient. The anxious subscale of attachment styles had a stronger correlation coefficient with the mean empathy scores ( $P = 0.041$ ,  $r = -0.125$ ), and the sub-scales of closeness ( $P = 0.998$ ,  $r = 0.0$ ) and dependency ( $P = 0.531$ ,  $r = 0.038$ ) had lower correlations with the mean empathy scores (Table 5).

**Table 2.** Frequency of Attachment Styles <sup>a</sup>

Type	Total	Medical Residents
<b>Attachment styles</b>		
Secure	76 (28.4)	15 (17.2)
Preoccupied	21 (7.8)	5 (5.7)
Fearful	127 (47.4)	56 (64.4)
Dismissing	44 (16.4)	11 (12.6)
<b>Attachment styles</b>		
Secure	76 (28.4)	15 (17.2)
Insecure	192 (71.6)	72 (82.8)

<sup>a</sup> Values are expressed as No. (%).

**Table 3.** The Relationship Between the Mean Empathy Scores with Sociodemographic and Psychological Characteristics

Hypothesis	t <sup>a</sup>	df	P-Value <sup>b</sup>	95% CI	
				Lower	Higher
<b>Gender</b>	1	226	0.305	-1.700	-5.409
<b>Educational level</b>	-	266	0.650	-4.443	2.776
<b>Marital status</b>	-	171	0.056	-7.214	0.092
<b>History of psychiatric disorder</b>	1.47	266	0.141	-2.125	14.852
<b>Family's place of residence</b>	0.92	266	0.358	-3.490	10.461
<b>Nativity status</b>	1.79	266	0.073	-0.293	6.514
<b>History of empathy training workshop</b>	0.290	244	0.772	-4.881	6.563
<b>Parental death in childhood</b>	0.343	260	0.732	-7.789	11.073
<b>Parental death in adolescence</b>	1.35	256	0.177	-2.316	12.504
<b>Attachment styles (secure &amp; insecure)</b>	-0.069	266	0.945	-3.883	3.620

<sup>a</sup> Assumption of equal variances.<sup>b</sup> t-test.**Table 4.** The Relationship Between the Mean Empathy Scores with Sociodemographic Characteristics and Attachment Styles Using ANOVA Test

Quantitative Variables	Sum of Squares	df	Squared Means	f	P-Value
<b>Attachment styles (fearful, ...)</b>		19959.692		0.414	0.743
Within groups	246.007		82.002		
Between groups	52332.959		198.231		
Total	52578.966				
<b>Age groups</b>		195.825		1.420	0.228
Within groups	1111.320		277.830		
Between groups	51467.647		195.694		
Total	52578.966				
<b>Family's monthly income</b>		19959.692		0.321	0.810
Within groups	192.438		64.146		
Between groups	5236.321		199.852		
Total	52553.759				
<b>Interests in field of study</b>		20155.517		0.241	0.868
Within groups	143.567		47.856		
Between groups	52435.399		198.619		
Total	52578.966				
<b>Drug abuse</b>		195.825		1.173	0.323
Within groups	1157.384		231.477		
Between groups	51296.601		197.295		
Total	52453.985				
<b>Residency subspecialty</b>		20155.517		0.271	0.846
Within groups	195.825		65.277		
Between groups	19959.692		240.487		
Total	20155.517				

**Table 5.** The Relationships Between Mean Empathy Scores and Subscales of Attachment Styles Using Pearson Correlation Coefficient

Attachment Style Subscales	P-Value	r
Closeness	0.998	0
Dependent	0.531	0.038
Anxious	0.041	-0.125

## 5. Discussion

This study aimed to investigate the relationship between attachment styles and empathy scores among Iranian medical students. The results revealed no significant differences between empathy in individuals with secure and insecure attachment styles. However, there was a significant negative correlation between anxious sub-scale of insecure attachment style and empathy.

The mean empathy score for the medical students in this study was 99.99, which was lower than the mean scores obtained in some previous studies (15, 16). For instance, in a study by Wen et al. in China, the mean empathy score was 109.60, and in two studies in the US, the mean empathy scores were 114.3 and 115.5 (3, 6). In 2010, a research conducted by Shariat et al. reported a mean empathy score of 111 among Iranian doctors (2). The lower mean empathy score obtained in Iran could be due to the lack of development of empathy and communication skills during the years of education, a lack of interest in the selected field of study, and future income (17).

In addition, no significant relationships were found between the empathy scores of male and female students, which differed from the findings of studies conducted in the UK (5), Mexico (15), Japan (16), and Iran (1), where levels of empathy were reported to be significantly higher in women than men in nearly all investigations. However, a study by Klein and Hodges observed that empathy scores for male medical students were higher than those for females (18). These differences suggest that the effects of special factors that are unique to medical training in different countries and might be related to motivational aspects rather than differences between genders could lead to differences in the levels of empathy between non-Iranian and Iranian students. However, in contrast with this study, other studies expressed that since female physicians respond more readily to emotional signals, they spend more time visiting their patients than their male counterparts (19). It seems that understanding the differences between men and women in this regard is difficult and no theory exactly explains gender-related differences in empathy. Of course, recent findings in cognitive neuroscience show new developments related to empathy, which suggest that the origin of human empathy is located in the brain. It

is thought that mirror neurons play a key role in developing neuronal branching rings in the brain, which are considered important components of the morphology of the empathy infrastructure (20). Future findings in emotional neuroscience might lead to a deeper understanding of the mechanisms underlying gender differences in empathy and show what differences can be expected between genders. Although most studies demonstrate higher levels of empathy in women than in men, there is no evidence of gender differences in empathy with real life (4).

In this study, the most frequent attachment styles among the students were insecure ones and the majority of individuals had fearful insecure styles. In another study on infertile participants in Mazandaran province in Iran, 37.9% of the couples represented a secure attachment style, and the most frequent attachment styles among them were insecure ones (7). The results of this research showed no significant difference between the empathy score in individuals with attachment styles, and the anxious subscale of attachment styles had a stronger negative correlation with empathy. Some previous studies have highlighted that a lack of secure attachment style is associated with aggressive behavior, which inhibits empathy (21). However, probably medical students with secure attachment styles are more likely to choose specialties that require more relationships with patients (22). Also, one study on the relationship between attachment styles and empathy among Iranian nursing students revealed that secure attachment styles had a positive correlation with empathy, and a negative correlation was found between empathy and insecure attachment styles (12). A study by Ardenghi et al. on Italian medical students during pre-clinical years showed that the attachment styles of medical students are related to their self-evaluated empathetic attitude, over and above the effects of gender and age differences and among their attachment styles. The relationships secondary to achievement were the most important significant predictor of both emotional and cognitive empathy variables (23). In their research, the attachment styles were evaluated using the 40-item Italian version of the Attachment Style Questionnaire (ASQ), which is different from our study questionnaire.

Given that anxious subscale in attachment styles negatively correlates with empathy, it seems that medical students with lower levels of anxiety might have higher levels of empathy in their relationships. This is because when medical students face problems they need to pay more attention to patients and develop affective bonds with them. However, this study was not in line with the basic sense of attachment as higher empathy in individuals with secure attachment was expected (9).

As mentioned above, the anxious subscale of attach-



ment styles had a stronger negative correlation with empathy, which was contrary to the study by Trusty et al. (24). Trusty et al. examined how a model of attachment styles affects emotional empathy among counseling students and found that both avoidant and anxious subscales act together to influence their affective empathy. In accordance with attachment theory, avoidance and anxiety were found to mediate each other in their effects. Based on attachment theory, lower anxiety and lower avoidance (secure attachment) along with higher affective empathy could be observed among counseling students, but the counseling students with higher anxiety and lower avoidance in the study by Trusty et al. experienced higher levels of empathy. Preoccupation is associated with communications and higher levels of sociability and interpersonal warmth, and such individuals have a strong perception on others' emotions (24). A study involving counseling students demonstrated that basic negative perceptions are accompanied by stronger counseling skills and conducted in favor of the concept of the wounded healer (25). Some researchers stated that anxiety about relationships might make medical students more sensitive to their patients. Therefore, while distress and insecurity in early family experiences, preoccupation with communications, and the need for approval from others might not directly inhibit the ability of doctors to empathize, coping and adapting to these problems encourages doctors to be more effective in helping others. The views adopted by attachment theory also give more value to affective regulation than emotional expressiveness and sensitivity (9, 25). In medicine, the use of emotions is often at a high degree, and selflessness in interpersonal relationships is more suitable for physicians compared with other interpersonal situations. Although preoccupation with communications and the need for approval (anxiety) might cause medical students to be sensitive to patients' emotions, such distress and insecurity might have lasting effects on students. Both attachment theory and the concept of the wounded healer have frameworks that can be used to understand and respond to the anxiety of medical students (24).

Little attention has been paid to the effect of attachment styles on empathic attitude, but this issue needs to be considered in medical training. Our results provide preliminary evidence of the potential role of attachment styles in predicting empathic attitude among medical students and highlight the application of incorporating attachment styles assessment in medical education.

Future studies should follow the lead of basic scientific research that conceptualizes empathy as relational—an engagement between a subject and an object—rather than a personal quality that may be modified wholesale through appropriate training (26). Future studies should conduct

qualitative studies in natural and real-life environments by observing and filming patients. Longitudinal studies also need to be developed to track individuals during training at medical schools and to record their changes in levels of empathy and attachment styles. Empirical studies are also recommended to find out more about the issues and obstacles to the ontology and epistemology related to empathy. Phenomenological studies are also required to examine the experiences of doctors and students and the senses of empathy in patient care. Given that this study was conducted with a self-report design, observational studies are recommended for further research.

This study had several limitations. First, since a self-report questionnaire was used, the respondents might have reported higher or lower levels of empathy than their true levels for numerous reasons. Second, the limited sample size selected from one university and one country limits the generalizability of our findings. Third, 43 students failed to complete the questionnaires correctly. Those individuals who did not participate in this study might have fewer tendencies to show empathy, and thus the mean empathy scores might be lower in reality than those reported in this study. Some residents were unwilling to complete the questionnaires and they returned incomplete questionnaires due to work pressure.

### 5.1. Conclusions

The results of this study showed that different training methods should be used to increase empathy levels among medical students. Attention to assessment and improving empathy during medical training by offering targeted programs is important for enhancing clinical skills. At the beginning of the general medicine and residency training programs, the concept of the wounded healer can be explained to students to help them raise their levels of self-awareness and develop an understanding of how they can use their anxiety to achieve positive goals in favor of their patients. Because avoiding emotions is destructive and students need to face their challenges, it is necessary to help students normalize their anxiety. Better self-awareness and increased sensitivity to others' emotions and needs are among the positive effects of anxiety.

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### Footnotes

**Authors' Contribution:** F. E.: Contributed to the conception, drafting, language editing, and editing of the

manuscript; P. E.: Contributed to the statistical analyses and interpretation of data; S. H.: Contributed to the conception and data gathering; M. A. and M. K.: Contributed to the editing of the manuscript.

**Conflict of Interests:** There are no conflicts of interest.

**Ethical Approval:** This study was approved by the Ethics Committee of Mazandaran University of Medical Sciences (IR.MAZUMS.REC.1397.011, Link: [ethics.research.ac.ir/ProposalCertificateEn.php?id=19061](https://ethics.research.ac.ir/ProposalCertificateEn.php?id=19061)).

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