ORIGINAL ARTICLE

STRESS AND HARDINESS IN MEDICAL RESIDENTS

ESTRESSE E HARDINESS EM RESIDENTES MÉDICOS

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ABSTRACT

Objective: to analyze the association stress and Hardiness in medical residents. Method: quantitative and analytical study, in which applied a form of socio-demographic data, the Scale of Stress at Work and the Scale of Hardiness in 112 residents between February and April 2011, at a Federal University in the interior of Rio Grande do Sul (RS)/Brazil. For the analysis, we used the inferential statistics. The research project received approval in the Committee of Ethics in Research, CAEE: 23081.020160/2010-06. Results: there was a significant difference between the intensity of stress and intensity of areas of Scale of Hardiness, as well as significant negative correlation between low stress and Hardiness. Conclusion: it was confirmed the Hardiness as predictor of low stress. It was produced the hypothesis that individuals have High Control and High Commitment as initial traits and High long-term challenge. Descriptors: Nursing; Psychological Stress; Psychological Adaptation; Service training; Internship and Residency.

RESUMO

Objetivo: analisar a associação estresse e Hardiness em residentes médicos. Método: estudo analítico, transversal e quantitativo em que se aplicaram um formulário de dados sociodemográficos, a Escala de Estresse no Trabalho e a Escala de Hardiness em 112 residentes entre fevereiro e abril de 2011, em uma Universidade Federal de Ensino no interior do Rio Grande do Sul (RS)/Brasil. Para o análise, utilizou-se a estatística inferencial. O projeto de pesquisa recebeu aprovação no Comitê de Ética em Pesquisa, CAEE: 23081.020160/2010-06. Resultados: houve diferença significativa entre a intensidade de estresse e a intensidade dos domínios da Escala de Hardiness, bem como correlação significativa negativa entre baixo estresse e Hardiness. Conclusão: confirmou-se o Hardiness como preditor do baixo estresse. Produziu-se a hipótese de que os indivíduos apresentam Alto Controle e Alto Compromisso como traços iniciais e o Alto desafio em longo prazo. Descriptors: Enfermagem; Estresse Psicológico; Adaptação Psicológica; Capacitação em Serviço; Internato e Residência.

RESUMEN

Objetivo: analizar la asociación estrés y Hardiness en médicos residentes. Método: estudio analítico, transversal y cuantitativo en que se aplicaron un formulario de datos socio demográficos, la Escala de Estrés en el Trabajo y la Escala de Hardiness en 112 residentes entre febrero y abril de 2011, en una Universidad Federal de Enseñanza en el interior de Rio Grande do Sul (RS)/Brasil. Para el análisis, se utilizó la estadística inferencial. El proyecto de investigación recibió aprobación en el Comité de Ética en Investigación, CAEE: 23081.020160/2010-06. Resultados: hubo diferencia significativa entre la intensidad de estrés y la intensidad de los dominios de la Escala de Hardiness, bien como correlación significativa negativa entre bajo estrés y Hardiness. Conclusión: confirmó el Hardiness como predictor del bajo estrés. Se produjo la hipótesis de que los individuos presentan Alto Control y Alto Compromiso como trazas iniciales y el Alto desafío en largo plazo. Descriptores: Enfermería; Estrés Psicológico; Adaptación Psicológica; Capacitación en Servicio; Internado y Residencia.

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Stress and hardness in medical residents.
INTRODUCTION

In Brazil, The medical Residency Program (MR) was standardized in 1964 by the Brazilian Association of Medical Education (BAME). Currently, there are about 3,500 programs in the country, with 53 specialties and 53 areas of expertise recognized by the Federal Council of Medicine. These programs are considered the "gold standard" of medical specialization and consist of a post-graduation whose teaching mode occurs in the service. So, during the residence, the professionals enter in the health institutions and do the process of medical work with patients and their families under the support of preceptors of different specialties.

The duration of residence ranges from two to five years according to the specialty, under weekly 60hs activities, being advocated the holding of 80 to 90% of the workload in the form of in-service training with qualified medical supervision and 10% to 20% through updates, seminars and clinic pathological correlation, among other priority programs.

In addition, such residents need to administer professional liability, live with severe patients, manage the demand of knowledge of the area and establish the limits between personal and professional identity. Still, coexist with the pressures on the expectations of achieving a high level of professionalism, responsibility for the welfare of the patient, maintaining relations with this and other health professionals and with the concern about medical errors. In the period of residence, these professionals live with situations like: sleep deprivation, fatigue, excessive care, excessive administrative work, problems concerning the quality of education and the educational environment.

It is observed that medical residents are exposed to stressors of their profession and the teaching-learning process, which can take them to stress. This is defined according to the interactionist model, as any stimulus that demands of external or internal environment and that tax or exceed the adaptation of an individual or social system. In the workplace, stress occurs when the individual evaluates the demands as excessive to the coping resources he has, which may represent a risk to the health of these professionals. In addition, in view of the multidisciplinary health teams forming which actions of different professionals are essential to pay attention to the user, the occurrence of stress between a professional category can influence the quality of the assistance provided by the patient.

It is highlighted that the identification of environmental stressors can assist in choices of coping strategies, as these vary according to the manner in which individuals evaluate such stressors. In this context, studies have pointed out that, although they co-exist with the stressors of different occupations, health professionals have brought low stress. In this way, the personality traits have been studied to identify people who may have a higher risk for the development of stress or who are refractory to this. Among them, we highlight the Hardiness, defined by the presence of features that provide resistance to stressors. In this sense, Hardiness is resistant personality to stress and it is defined as the ability of people to interpret the stressors as a challenge, which allows the development of experiences that enable growth.

Hardy individuals present as characteristics: the belief of being able to control or influence the events of their experience; an ability to feel completely involved or engaged in the activities of their life; and the anticipation of change as an exciting challenge for personal growth. These concepts include, respectively, the domains: Control, Challenge and Commitment that characterize the Hardiness personality. In addition, these individuals have a personality that enhances performance, behavior, morality, strength and health. Thus, the Hardiness presents a contrast to the stress and its negative outcomes, such as Burnout and depression. For this reason, it is considered a positive indicator for health.

Knowing that the stressors in healthcare and educational environment of medical residence influence the working and learning process of residents and that the Hardiness personality has been presented as the explanation for the low stress in professionals exposed to stressors in the work environment, we put forth the hypothesis that individuals under stress have hardiness personality. Thus, the aim of this study was to verify the association between stress and hardiness in Medical Residents.

MÉTODO

Transversal, quantitative and analytical study, developed in a Federal University of Education within of Rio Grande do Sul (RS)/Brazil, which offers 29 programs accredited by the National Commission of Medical Residency, consisting of 19 specialties and 10 practice areas recognized by the Federal Council of Medicine and Brazilian Medical Association. The program aims to enhance the knowledge and experience of
new graduates' doctors to better qualify them, to allow rising to the professional responsibilities and develop the taste for study and research.13

Residents of all specialties and areas of expertise of the program and regularly enrolled in collecting period were included. Residents on leave of any kind or on vacation were excluded. Thus, the study population was composed of 121 medical residents. Of these, two left the program, two did not accept to participate in the research and five of them did not give back the instruments. So, a population of 112 (92.56%) residents were achieved.

Data collection was carried out during the period from 15 February to April 30, 2011, through a form of socio-demographic and professional data, Work stress scale (WSS) and the Hardiness Scale (EH).12 These instruments were applied to guests and who agreed to voluntarily participate in the research, by signing the Free and Clarified Concent Term (FCCT), after being informed of the objectives and characteristics of the study.15

The socio demographic form addressed the following variables: age, presence and number of children, sex, marital status and with whom resides.

The WSS, built and validated in 200414, consists of 23 items arranged in five-point likert type scale, where: 1- totally disagree, 2- disagree, 3- agree in part, 4- agree and 5- totally agree. The Hardiness Scale, adapted to the Portuguese in 200912 and validated in 201216, is composed of 30 items arranged in four-point likert type scale, where: 0- nothing true, 1- a little true, 2-almost all true and 3-completely true. The items are arranged in three domains: Control (2, 3, 8, 9, 12, 15, 18, 20, 25 and 29), Commitment (1, 6, 7, 11, 16, 17, 22, 27, 28 and 30) and Challenge (4, 5, 10, 13, 14, 19, 21, 23, 24 and 26).

After the collection, the data were organized and stored in a spreadsheet in EXCEL 2007 (Office XP) and statistically analyzed with Statistical Analysis software System (SAS), version 9.02. The internal consistency of the instruments was assessed by Cronbach's Alpha Coefficient. The qualitative variables were presented in absolute values (n) and relative (%). The quantitative variables were presented in descriptive measures: mean, standard deviation, minimum and maximum values.

For analysis of the WSS, it was done the average per individual from the sum of the scores assigned to each item, divided by the number of items in the instrument. Later, it was scored an average of individuals and was divided this amount by the number of subjects that composed the database, obtaining the overall average of the population. From this measure, the responses were dichotomized in "high" and "low-stress".

To the Hardiness Scale, the sum of the scores assigned was done to each item and divided by items that composed the domains, which allowed obtaining the average per individual in each domain. Later, it was done the sum of the averages of the individuals in each domain and the division of that sum by the number of study subjects, obtaining the averages for the domain of EH. From these measures, the answers were dichotomized in "high" and "low" in each domain in the scale of Hardiness. It is highlight that the scores of items 3, 4, 5, 6, 8, 13, 16, 18, 19, 20, 22, 23, 25, 28 and 30 should be reversed to then be added.13 In addition, ratings obtained has been associated to the obtained classification by individuals in three domains. So, when the Association was concomitantly High Commitment, High Control and High Challenge, the resident was considered with Hardiness Personality.

To verify the relationship between the intensity of stress and the classification of resident doctors in the domain of Hardiness Scale, we used the Chi-square test (χ²). The analysis of associations between low stress and Hardiness was held through the Pearson Correlation test. Values of p 0.05 were considered significant statistically <, with 95% confidence interval. And also, there was the trend of relations between the constructs of Hardiness and stress ratings.

This study is part of the Stress project, Coping, Burnout, Depressive symptoms and Hardiness in Multiprofessionals and Medical Residents approved in Research Ethics Committee (REC) at the University under no. 23081.020160/2010-06.

RESULTS

In the analysis of the internal consistency of the items that compose the WSS and HS, the Cronbach's Alpha was 0.92 and 0.78 respectively. The Alpha for the domain of HS was 0.69 to Commitment,0.64 to Control and 0.66 to Challenge. According to authors17, these values are enough to vouch for the reliability of satisfactory internal instruments for the study population.

In relation to socio demographic characteristics, it was noticmale ed: residents (52.68%), singles (52.68%), in the age group between 26 to 30 years, no
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Stress and hardiness in medical residents.

Table 1. Descriptive measures of Work stress Scale (WSS) and Hardiness Scale (HS) among medical residents of a Public University. Santa Maria, Rio Grande do Sul, 2013.

<table>
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<tr>
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<tbody>
<tr>
<td>WSS</td>
<td>23 items</td>
<td>2,20</td>
<td>0,67</td>
<td>1,00</td>
</tr>
<tr>
<td>HS</td>
<td>30 itens</td>
<td>1,76</td>
<td>0,93</td>
<td>0,36</td>
</tr>
<tr>
<td>Commitment</td>
<td>2,01</td>
<td>0,57</td>
<td>0,50</td>
<td>3,10</td>
</tr>
<tr>
<td>Control</td>
<td>1,87</td>
<td>0,48</td>
<td>0,60</td>
<td>3,00</td>
</tr>
<tr>
<td>Challenge</td>
<td>1,42</td>
<td>0,35</td>
<td>0,60</td>
<td>2,70</td>
</tr>
</tbody>
</table>

*Standard Deviation

In the evaluation of stress intensity of resident doctors, 59.82% of them have high stress and 40.18% low stress.

As to the classification of individuals by the domain of HS, 52.67% have high measure in Control, 53.67% high in Commitment and 48.21% high in Challenge. From the domain Association, it is noticed that 23.21% (n = 26) of medical residents have Hardiness personality characteristics.

When analyzing the relationship between the stress intensity and the domain of HS, it appears that there is statistically significant difference between these variables, that is, there is significant association between the intensity of stress and intensity of domains of HS: Commitment ($\chi^2 = 12.88; p = 0.00$), Control ($\chi^2 = 8.86; p = 0.00$) and Challenge ($\chi^2 = 10.25; p = 0.00$). In this sense, it was done the analysis of associations between low stress and Hardiness Scale, considering the three domains and 30 items of the Scale (Table 2).

Table 2. Main correlations between low stress and the Hardiness Scale in medical residents. Santa Maria, Rio Grande do Sul, 2013.

<table>
<thead>
<tr>
<th>Hardiness Scale</th>
<th>Low Stress</th>
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<td>Domains</td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>r = -0.415* (p = 0.00)</td>
</tr>
<tr>
<td>Control</td>
<td>r = -0.454* (p = 0.00)</td>
</tr>
<tr>
<td>Challenge</td>
<td>r = -0.332* (p = 0.00)</td>
</tr>
<tr>
<td>General</td>
<td>r = -0.529* (p = 0.00)</td>
</tr>
</tbody>
</table>

*Statistically significant Correlations (p < 0.05).

It is evidenced that the individuals in low stress have Hardiness Personality. In addition, it appears that the higher the intensity of Control, Commitment and Challenge of residents, lower the intensity of stress between them. In Figure 1, are presented the trends of relations between the domains of Hardiness and stress classifications.
Figure 1. Trend of relations between the domains of Hardiness and stress classifications

It is observed that there is a tendency of medical residents in low stress present high challenge, to interpret the demands of working and training environment as stimulants for professional growth. As residents in high stress, there is a tendency of these present low challenge, high commitment and high control.

**DISCUSSION**

The work is necessary for the survival of the human being, because it allows the livelihood and it is through it that the employee carries out his social role. However, the conquest of that role in the context of work binds to global developments and the growing demand for information and knowledge. Accordingly, the residency is an option for doctors just graduated seeking to enter the job market with more safety and qualification.

The Medical Residency is a period in which the resident must learn how to deal with feelings of vulnerability, to make a balance between the desire to care for and heal and manage feelings in relation to the health care system complex. So, the situations experienced by the doctor during the residence, can be evaluated as stressors and take them to stress.

In this context, it was observed that 59.82% of medical residents have high stress. For Brazilian researcher, stress in medical residency may occur due to: aspects of professionalization, as with patients whose pathologies are unwieldy; situational aspects, such as the ones relating to the quality of training; and personal aspects such as the socio-economic condition, family problems and life events. So, based on this proposal and on the results of this study, it can be said that medical residents have evaluated the work and training as stressors, i.e. as taxing or exceeding their capacities or adaptive resources.

However, although entered in the same process of formation, 40.18% of resident doctors had low stress. In this sense, it is evidenced that the perception and responses to stressors can vary from one person to another. To explain these different reactions from individuals to experienced stressors, Hardiness Personality have been proposed as a theoretical construct and analyzed between different populations. In this sense, has sought to describe the internal and external resources used by these people to minimize the effects of the stressors as well as the presence of the characteristics that define that personality, to be Commitment, Control and Challenge.

Thus, there was an average of 2.01 (± 0.57) for the domain Commitment, 1.87 (± 0.48) for the control and 1.42 (± 0.35) for the Challenge. Based on these values, it was noticed 52.67% of residents with high averages in Control, 53.67% high in Commitment and 48.21% high in Challenge. In this context, we highlight the importance of these three defining characteristics of Hardiness Personality. According to authors, the individual with high Commitment believes that it is important to keep involved with people and events rather than isolate and alienate. The person with high Control attempts to maintain an influence on the results rather than be powerless and passive in the situation. The individual with high Challenge interprets the stressor as something normal and an opportunity to learn more instead of maintaining a position of comfort and safety.

From this point of view, it was observed that 23.21% of resident doctors presented the above-mentioned characteristics at the same
time, that is, Hardiness Personality. In study\textsuperscript{21} with managers nurses from a hospital of Texas (USA), it was found that 60\% were professionals with that Personality. In this context, researches have pointed out that the Hardiness, while moderator of stress, it tends to lessen the effects of stress that can lead to depression.\textsuperscript{21} Furthermore, in research\textsuperscript{24} with students from California (USA), the Hardiness Personality presented significant relationship with student achievement at the academy and a greater prediction of power performance ($B = 0.166$) than other variables, such as the students’ satisfaction with life ($B = 0.126$). In this way, it can see that the Hardiness Personality has been analyzed with a strategy of strengthening of other personal characteristics such as Performance, and reducing the effects of stress, in view of the negative outcomes of this phenomenon, as the depression.

However, there are limited national and international studies that analyze the relationship between high/low stress and occurrence of this personality in health professionals. Thus, in this study, it was found that medical residents in low stress present Hardiness Personality ($r = 0.529 ^*; p = 0.00$). In the research\textsuperscript{20} among nurses of Quebec (Canada), statistically significant correlation was found between Hardiness and stress ($r = 0.42; p < 0.001$).

Based on these findings, it appears that the Hardiness is a predictor of low stress. In this sense, the findings of this study strengthen the contention that Hardiness facilitates actions that modify the interpretation of the stressful circumstances, being these views as a benefit to performance and possibility of growth, with maintenance or even increase of health of individuals to stressors and their effects\textsuperscript{24}.

As for the analysis of associations between the domains of the HS and low stress, it was noted in Table 2, that there are statistically significant correlations between the three domains and low stress. As for the Challenge, the results obtained by the correlation test are strengthened by those presented in Figure 1, in which there was tendency of medical residents in low stress present high challenge. So, these professionals tend to interpret the demands of working and training environment as stimulants for professional growth.

On the relationship between low stress and Commitment and Control the significant inverse Association found by Pearson Correlation indicates that the greater the Control and Commitment of residents, lower the stress intensity, which confirms the proposition of theoretical reference that the high Commitment and the high Control are related to a lower stress intensity. However, in Figure 1, residents on the high commitment and high control tend to have high stress. In this way, it is assumed that, to experience the stressors of a given context and stage of life, the professionals can seek to control events and be committed to the work activities in order to reduce the stress level in which they find themselves. Later, they may have lower level of stress, with strengthening of the Control and Commitment to stressors, which agrees with the findings of Table 2.

In the first analysis, it is confirmed the assertion that one of the positive effects of Hardiness is modification of perception of stressors, which already has been demonstrated in studies among students.\textsuperscript{22} In the analysis of Figure 1, you can extract this different interpretation of stressors is a process that is going on for some residents. So, it highlights that the characteristics of the Hardiness Personality can be learned and strengthened along the life through the experience with environmental stressors, academic training and personal life. Furthermore, since the relationship of Hardiness with health promotion strategies have been proposed in this personality among different populations.\textsuperscript{22}

**CONCLUSION**

It was confirmed the hypothesis that the Hardiness works as a predictor of low stress among medical residents. These personalities allows differentiated interpretation of stressors and, therefore, lower risk of these health professionals, in view of the negative effects of stress in the lives of these individuals.

As limitation, it is noticed reduced number of national and international studies involving medical residents and other professions in relation to the subject dealt with and offering an analysis of the relationship between Hardiness and the intensity of stress. Also, in some studies, although that personality analysis, there is no description of its occurrence in populations (professionals and students), which made it difficult to compare the results of this study with further investigation on this variable. Therefore, it can be said that the relevance of this study focuses on the analysis of the relationship between stress strength and Hardiness, as well as in the description of the occurrence of this personality.

According to trend analysis, it was found that medical residents in high stress tend to
adopt attitudes of commitment and control in order to minimize the effects of the stressor. On this basis, new issues emerge, namely: While individuals in high stress tend not to interpret the stressors as challenges? Would this occur after the individual present high control and high commitment? So, the hypothesis produced in this research was that individuals present as initial traces the high Control and High Commitment and, in the long run, the high Challenge, which would explain the low ranges verified in the Challenge by cross-sectional studies. To check this hypothesis and answer the proposed questions, it is suggested the longitudinal design with studies in order to observe how the process of Hardiness Personality development is as its dimensions, as well as the period in which is reflected on the career of the resident doctor.

Furthermore, on the basis of relationships found between personality and the intensity of stress the resident doctors, as well as those already identified in other research, highlighted above, it is suggested to conduct studies with experimental design that propose Hardiness promotion strategies among medical residents and other people in health care, because the relationship between the worker’s health and the quality of care provided.

REFERENCES


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