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PSYCHOMETRIC PROPERTIES OF THE ALBANIAN VERSION OF THE EFFORT-REWARD IMBALANCE MODEL IN A SAMPLE OF HEALTHCARE WORKERS IN SHKODRA, ALBANIA HOSPITAL

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Key words: *effort-reward imbalance (ERI) questionnaire, Albanian version, healthcare workers, psychometric properties*
Ключові слова: *опитувальник дисбалансу зусиль і винагороди (ERI-модель), албанська версія, медичні працівники, психометричні властивості*

Abstract. Psychometric properties of the Albanian version of the effort-reward imbalance model in a sample of healthcare workers in Shkodra, Albania hospital. Pjetri Emiljano, Shabani Zamira, Shala Irena, Bekteshi Adem. *The goal of this study was to test the reliability and validity of the Albanian version of the 23-item effort-rewardimbalance (ERI) questionnaire and to analyze its association with job dissatisfaction in a sample of Albanian healthcare professionals working in Regional Hospital in Shkodra.A cross-sectional study on a representative sample was carried out. Descriptive statistics was performed. Cronbach's alpha coefficient was calculated to estimate the internal consistency reliability. Significant differences were calculated using ANOVA. A total of 270 study participants were involved in the study, and the response rate was 81% (219/270). Women and those with master degree predominated. The consistencies of the three scales: effort, reward, and overcommitment were obtained. Mean ratio effort-reward was all the time higher than 1 for all cases in the study. Results show a significant difference for effort and overcommitment based on gender and department in which a person is working.This study is the first one supporting psychometric properties of the Albanian version of the ERI model. Based on the results of this study the Albanian version of the ERI questionnaire is considered a reliable and valid instrument for measuring psychosocial stress at work. Our suggestion is that it is applicable to Albanians working in healthcare sector.*

Реферат. Психометричні властивості албанської версії моделі дисбалансу зусиль і винагороди (ERI-модель) у вибірці медичних працівників лікарні Шкодер, Албанія. П'єтрі Емільяно, Шабані Заміра, Шала Ірена, Бектеші Адем. *Мета цього дослідження полягала в тому, щоб перевірити надійність і валідність албанської версії опитувальника дисбалансу зусиль і винагороди (ERI – effort-reward imbalance), який складається з 23 пунктів, і проаналізувати його зв'язок з незадоволеністю роботою у вибірці албанських медичних працівників, які працюють в обласній лікарні в м. Шкодер. Було проведено перехресне дослідження на репрезентативній вибірці. Виконано описову статистику. Для оцінювання надійності внутрішньої узгодженості було розраховано альфа-коефіцієнт Кронбаха. Значущі відмінності були розраховані за допомогою ANOVA. Загалом у дослідженні взяли участь 270 осіб, і кількість відповідей становила 81% (219/270). Серед опитаних переважали жінки та особи з магістерською освітою. Було отримано узгодженість трьох шкал: зусилля, винагорода та надмірна відданість. Середнє співвідношення зусилля – винагорода весь час було вищим за 1 для всіх випадків дослідження. Результати показують значну різницю для зусиль і надмірних зобов'язань залежно від статі та відділу роботи. Це дослідження є першим, що підтверджує психометричні властивості албанської версії моделі дисбалансу зусилля та винагороди. За результатами цього дослідження албанська версія опитувальника ERI вважається надійним і валідним інструментом для вимірювання психосоціального стресу на роботі. Ми припускаємо, що вона може бути застосовна до албанців, які працюють у сфері охорони здоров'я.*

In Albanian society like in all other societies, work continues to play an important role for health and well-being in adult life. Having a job is often a prerequisite for a continuous income, and, more

thoroughly than any other social circumstances, employment characteristics determine adult socio-economic status[1]. Beyond economic livelihood, a person's occupation is important for socialization. It provides opportunities for personal growth and development, including the favourable experience of oneself in a core social role, and allows participation in social networks beyond primary groups [2]. The nature of work has undergone profound changes in recent decades. Today, fewer jobs are defined by physical demands and more by mental and emotional demands. One job that needs physical, mental, and emotional demands is normally for the employees in the healthcare system.

As a result of the sweeping socio-economic transition that began in 1990, Albanian healthcare management and service delivery systems were dramatically reorganized.Numerous new programs were implemented, such as a compulsory national health insurance system, a primary healthcare strategy and family medicine. The organization of the healthcare system aims to make the work motivated for all employees and especially for all specialized personnel, which in many cases go abroad to work where the work in the healthcare system is more motivated.

Structuration of the system apart from the others means good salary and reduced health impact of job stress for all employees in healthcare system including nurses. According to Ilir Gëdeshi and Russell King (2018) the results obtained from a survey conducted among nurses in 2018, show that 83% of respondents want to migrate abroad[3]. Reforms in the nursing care model have had an impact on the provision of health care. Patient-centred nursing care has gradually replaced the disease-centred model. These changes have coincided with an increase in the understanding of the professional status of nurses, and the nurse profession is a profession regulated by law [4].

Health impact of job stress has been initially investigated through the demand-control model [5] where editors attempt to establish the relationship between occupational stress and organizational work. More recently, the effort-reward imbalance model[6], which focuses on the lack of social reciprocity and fairness between efforts spent and rewards received at work, has been widely tested and proven to be particularly successful in clarifying stress phenomena at work. The extrinsic effort scale represents the demanding aspects and obligations of the work environment, whereas the extrinsic rewards scale includes gains offered or promised via social and contractual reciprocity in terms of esteem, financial compensation, career opportunities and job security [7].

The ERI model postulates that a mismatch between effort and reward can elicit strong negative emotions and associated psychobiological stress reactions [6].The ERI model claims also that lack of reciprocity between efforts spent and rewards received in turn elicits sustained stress reactions with adverse long-term consequences for health. A number of recent studies have shown significant associations of stress at work, as predicted by the ERI model, with health outcomes and objective physiologic measures. ERI model was applied in a lot of countries to measure the stress of healthcare workers: for Belgian healthcare workers [8], Chinese healthcare workers [9], for military hospitals healthcare workers [10], for healthcare workers in Ethiopia[11], for Brazilian healthcare workers [12]. ERI model, was used to analyze connection with health outcomes and objective physiologic measures such as increased likelihood of coronary heart disease[13], [14], decreased salivary immunoglobulin [15] and levels among employees exposed to effort-reward imbalance [1]. These data support the utility of the ERI model in elucidating the health effects of occupational stress. This instrument has been adapted to several languages, and its psychometric properties have been investigated in different countries [1].

The Regional Hospital of Shkodra, (RHS) is in Shkodra city, in north Albania. RHS gives specialized medical services for inhabitants from cities Shkodra and Malësia e Madhe and all rural areas of these cities. There are about 190 thousand inhabitants [16]that receive medical care from the RHS and the number of visits reported for the year 2023 was a total of 175,000 visits, of which 12,500 hospitalizations, 82,840 visits to the emergency department and 79,610 outpatient visits[17]. RHS covers almost all health services with specialised doctors and nurses. The number of nurses in the hospital,rendering paramedical services and being the object of the study is 270.

This paper has two aims: first, to adapt the ERI questionnaire into the Albanian language and to investigate its internal consistency. To our knowledge, this is the first application of the ERI questionnaire in the Albanian language.

Second one, to test psychometric properties in a sample of Albanian healthcare workers, and associated factors among nurses' staff working in governmental hospitals in Shkodra city, north Albania. Healthcare work is characterized by rather high levels of work stress internationally known and studied [18], [19]and this study attempts to know to what degree this holds true for a sample of Albanian healthcare workers at the RHS. In several studies, job dissatisfaction was associated with an elevated risk of leaving job, a fact that calls for increased preventive efforts[20, 21].

MATERIALS AND METHODS OF RESEARCH

Questionnaire

The original ERI instrument is a 23-item questionnaire that evaluates the 3 dimensions of the ERI model: extrinsic effort (measured by 6 items), extrinsic reward (measured by 11 items), and overcommitment (measured by 6 items). Based on the developer's recommendation[22], a modified version was used whereby all 23 items were rated using a 6-point Likert scale, where a value of 1 indicates no respective stressful experience, and a value of 6 indicates very high stressful experience.

Ethical approval for this study has been reviewed and approved by the Ethical Committee, Faculty of Natural Sciences, Department of Clinical Subjects, University of Shkodra protocol No. 50/2, 10.10.2023, Shkodër Albania.

All questions refer to the participants for present occupation and subjects are asked to indicate how far the items reflect their typical work situation. It should be noted that the Likert scale answer format has been changed to six categories, as suggested by Siegrist J.[23] to indicate better work situation by each item.

The rating procedure is defined as follows: higher ratings pointing to higher efforts (Table 1): (1) don't agree at all, (2) moderately disagree, (3) disagree (4) agree, (5) moderately agree and (6) strongly agree.

Table 1

6-point Likert scale answer format in the ERI-Questionnaires

don't agree at all	**1**
moderately disagree	**2**
disagree	**3**
agree	**4**
moderately agree	**5**
strongly agree	**6**

After variable recoding procedures, total effort, reward and overcommitment scores were calculated by the sum of the scores of the corresponding items as suggested by Msaouel (2012) [7]. The theoretical range for the effort and over commitment scales was 6-36, with higher values indicating more intense effort and overcommitment, respectively. The reward scale score range was 11-66.

Based on the ERI scale scores there was calculated the extrinsic effort/reward ratio constructed using the effort score as the nominator and the reward score, multiplied by a correction factor of 0.5454(=6/11) to adjust for the number of items, as the denominator [22]. This measurement provides an approximate estimate of the potential mismatch between extrinsic effort and reward at work.

Study design and population

An institution-based quantitative cross-sectional study was carried out from November 10 to December 15, 2023 among nurses working in governmental hospitals in Shkodra, north Albania. Regional Hospital of Shkodra is the only governmental hospital in Shkodra city and north Albania that offers main health services for people who live in Shkodra, Malesia e Madhe and rural area around the cities, with a population of more than 190 thousand people.

There are some small private hospitals and private clinics located in Shkodra city, but those were not the object of our study. There were a total of 270 nurses working in RHS during the study period. This is the biggest number of nurses working in healthcare in Shkodra city, besides, there are few nurses working in private healthcare system in Shkodra city.

All nurses who were fulltime employees of RHS were source population. Nevertheless, some nurses did not send filled questionnaire back to research team. From 270 nurses in different departments of RHS, a total of 219 questionnaires were returned (participation rate 81.1%). After variable recoding procedures, total effort, reward and overcommitment scores were calculated by the sum of the scores of the corresponding items [12].

Statistical analyses

For data gathered, mean values and standard deviations for each scale derived from the theoretical model proposed by Siegrist were calculated, i.e. effort, reward, and overcommitment. For each scale, reliability was assessed by the Cronbach's alpha coefficient (internal consistency) [24], [25]. For statistical analyses SPSS version 20 was used.

RESULTS AN DDISCUSSION

Table 2 gives information on the sample composition (means (SD) and percentages of sociodemographic, qualification, occupational characteristics) of the 219 subjects that participated in this study. Of the participants 171 (78.1%) were women and 48 (21.9%) were men. Mean age and standard deviation of all participants was 40.7 (±11.7) years. Mean age and standard deviation of women was 40.4 (±11.8) years, the youngest female nurse was 22 years old and the oldest – 61 years old. Mean age and standard deviation of men was 41.8 (±11.4) years, the youngest male nurse was 24 years old and the oldest one – 62 years old.

Mean length of service in healthcare of all participants was 16.2 (±11.4) years, with minimum

duration of 0.25 year (only 3 months) and maximum 41.0 years. For women mean length of service in healthcare was 16.1±11.5 years and for men – 16.7 (±11.2) years.

Of all nurses that participated in the study 76 (34.7%) had bachelor degree and 143 (65.3%) of them had master level of study. Of all women participants in the study 56 (32.75%) had bachelor level of study and 115 (67.25%) had master level of study. Men participated in the study: 20 (41.67%) with bachelor level of study and 28 (58.33%) with master level. Among employed nurses in RHS, those with a master's degree predominated, which is more pronounced in female nurses.

The biggest number of nurses in the RHS that participated in the study was from the emergency and paediatric department 31 (14.2% of all participants) and 26 (11.9% of all nurses participated in the study), respectively.

Table 2

Socio-demographic characteristics of the study subjects

Variables	Women 171	Men 48	Total 219
	mean (SD)	mean (SD)	mean (SD)
Age (years)	40.4(±11.8)	41.8(±11.4)	40.7(±11.7)
Length of service (Years)	16.1(±11.5)	16.7(±11.2)	16.2(±11.4)
Education Level - Number (%)			
Bachelor	56 (32.75)	20 (41.67)	76 (34.7)
Master	115 (67.25)	28 (58.33)	143 (65.3)
Department	Number (%)	Number (%)	Total (%)
Cardiology	12 (7.02)	4 (8.3)	16 (7.3)
Dermatology	4 (2.3)	0 (0.0)	4 (1.8)
Emergency	7 (4.1)	24 (50.0)	31 (14.2)
Infection	13 (7.6)	1 (2.1)	14 (6.4)
Intensive care	12 (7.0)	9 (18.8)	21 (9.6)
Neurology	25 (14.6)	0 (0.0)	25 (11.4)
Obstetric	7 (4.1)	0 (0.0)	7 (3.2)
Ophthalmology	4 (2.3)	0 (0.0)	4 (1.8)
Pathology	20 (11.7)	3 (6.2)	13 (10.5)
Pediatrics	26 (15.2)	0 (0.0)	26 (11.9)
Psychiatry	8 (4.8)	4 (8.3)	12 (5.5)
Pulmonology	12 (7.0)	0 (0.0)	12 (5.5)
Surgery	21 (12.3)	3 (6.2)	24 (11.0)

Table 3 describes the psychometric properties of the instrument used to measure the effort-reward and over commitment factors. All Cronbach's alpha values were satisfactory, with α=0.705 on the "effort" scale, α=0.654 on the "reward" scale, and α=0.672 on the "over commitment" scale. According to this, item responses obtained for each scale correlate well with each other, indicating good internal consistency of Albanian ERI

questionnaires. For nurses working in RHS, ratio between effort and reward was all the time higher than 1. For men and those with master degree this ratio was the highest, 1.23 and 1.12 respectively. The ratio was higher in the age group of nurses over 51 years.

Results of ANOVA are shown in Table 4. ERI was significant related to effort for changes based on gender and hospital department, ERI was significant related to reward for changes to hospital department and ERI was significant to over commitment related to gender.

Table 3

Values of mean (SD) of ERI scale related to gender, education, and group age

		Effort α=0.705	Reward α=0.654	Over commitment α=0.672	Effort-reward ratio
ERI	**Total(219)**	**23.9 (±5.4)**	**40.68 (±5.3)**	**22.9 (±4.2)**	**1.106 (±0.33)**
Gender	**Women(171)**	**23.1 (±5.2)**	**40.64 (±5.2)**	**23.1 (±4.1)**	**1.071(±0.32)**
	Men(48)	**26.8 (±5.2)**	**40.8 (±5.9)**	**22.1 (±4.5)**	**1.23(±0.32)**
Education	**Bachelor(76)**	**23.7 (±5.8)**	**41.2 (±5.6)**	**22.9 (±4.3)**	**1.09 (±0.34)**
	Master(143)	**24.0(±5.1)**	**40.4 (±5.2)**	**22.9 (±4.1)**	**1.12 (±0.32)**
Group age	**≤30(61)**	**21.9(±5.9)**	**39.8(±5.6)**	**21.9(±5.0)**	**1.04(±0.36)**
	31-40(53)	**24.8(±4.9)**	**41.0(±5.5)**	**22.9(±3.7)**	**1.14(±0.33)**
	41-50(49)	**23.6(±4.6)**	**41.2(±5.2)**	**23.5(±4.0)**	**1.08(±0.30)**
	≥51(49)	**24.8(±5.2)**	**40.7(±5.1)**	**23.3(±3.8)**	**1.15(±0.31)**

Table 5 shows the correlations between the components of the ERI model (i.e. ERI, efforts, rewards, overcommitment, and effort-reward ratio). Results showed a significant relationship between the three components of the ERI model (all $p<0.01$), and negative relationship between effort and reward was observed.

Table 4

ANOVA results of ERI related to gender, education and hospital department

	Effort	Reward	Overcommitment
Gender	**F=18.79 p=0.000**	**F=0.05 p=0.828**	**F=5.43 p=0.000**
Education	**F=0.11 p=0.739**	**F=0.96 p=0.328**	**F=0.001 p=0.998**
Hospital department	**F=4.02 p=0.000**	**F=4.02 p=0.000**	**F=2.39 p=0.123**

Notes: F-value (F-ratio) is the value of Fisher test that compares the ratio of the Between and Within variation, larger ratio indicates that difference between means exists; p-value indicates if the ratio is significant ($p<0.05$ difference is significant).

This paper analyzed basic psychometric properties of the Albanian version of the ERI questionnaire. Our study found satisfactory psychometric properties of the Albanian version of a theory-based questionnaire measuring work stress in terms of ERI. There were a lot of publications that confirm the usefulness of ERI scale adoption in several languages [1], [12], [26], [27], [28], [29] and our study is the first in Albanian language.

The Cronbach's alpha coefficients for the three scales of effort, reward and overcommitment in our study are somewhat lower compared with working population from previous reports [9], [28], [29], [30]. In part, this deviation might be due to the study population that is restricted to healthcare workers with stable jobs in the RHS, small number of subjects, and ambiguity in completing the questionnaires, and

incomplete expertise from the work group (the first report exploring psychometric properties of the Albanian version of the ERI questionnaire).

In our study the effort-reward ratio varies from 0.44 to 1.9 with mean value of 1.106 (±0.33) for all subjects participating in the study. Mean effort-reward ratio was higher for men (1.23±0.32) and for age group over 51 years (1.15±0.31). Although reducing the effort-reward ratio to a dichotomized measure (with values >1.0 indicating an imbalance of high effort and low reward) may lead to a loss of detailed information [31], the fact that the majority of Albanian healthcare workers (60.0%) scored above 1.0 still points to a substantial effort-reward imbalance in this population. Data from other countries have shown elevated levels of effort-reward ratio [7], [32], [33].

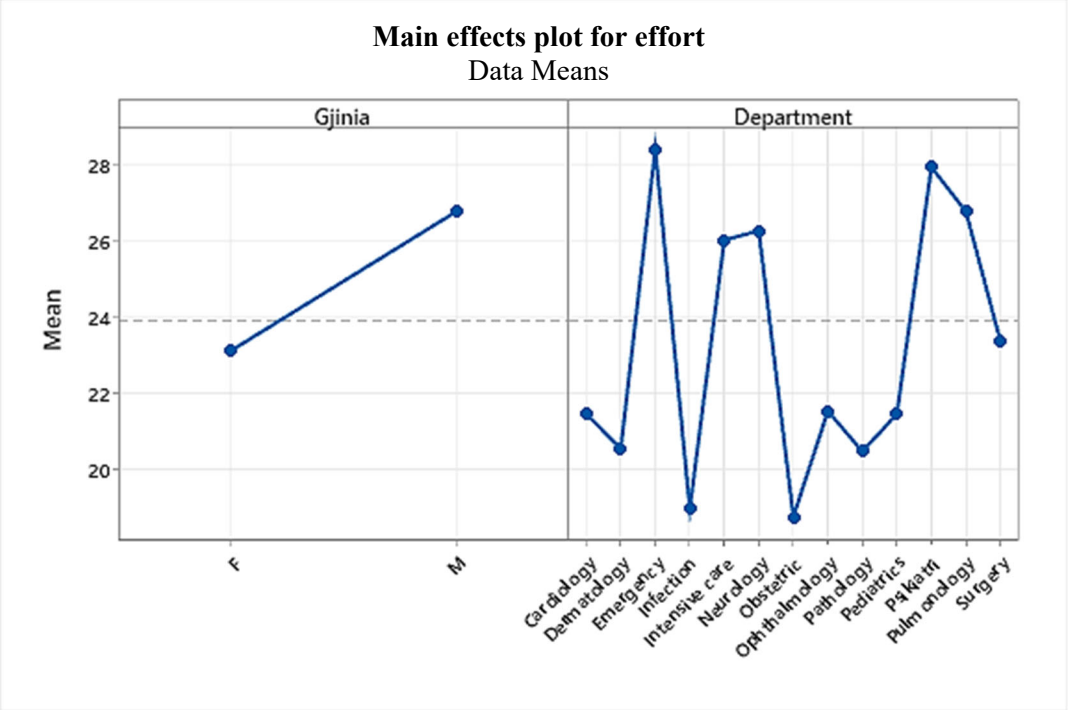
Table 5

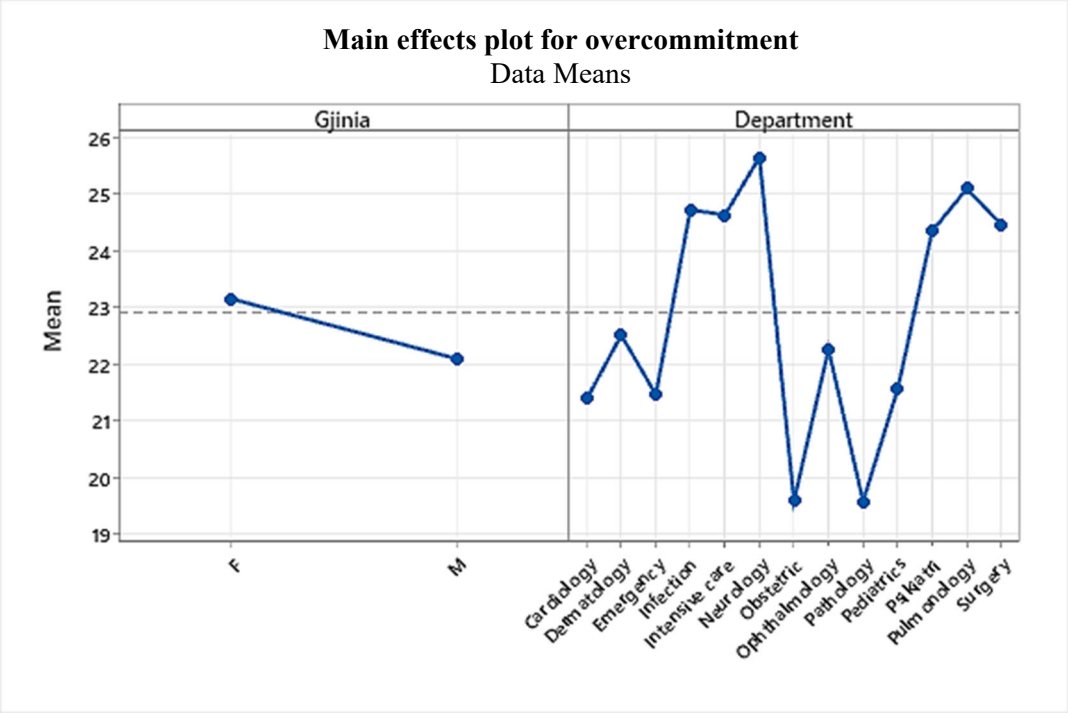
Correlation between ERI, effort, rewards, overcommitment and ratio efforts- rewards

	ERI	Efforts	rewards	Overcommitment
Efforts	**0.563***			
Rewards	**0.485**	**-0.312**		
Overcommitment	**0.739***	**0.285**	**0.133**	
Ratio efforts-rewards	**0.181**	**0.886***	**-0.699****	**0.132**

Notes: p<0.01; * – shows a positive correlation; **– show a negative correlation.

Analysis with ANNOVA shows a significant difference to effort and overcommitment related to gender and hospital department (Figure). In our study, male nurses' result with higher effort in work compared to female nurses, and nurses working in the emergency department have the highest results in the effort. In our opinion men are doing more difficult work than women and the work in the emergency department is the most difficult compared to other departments of hospital. As for overcommitment, women think that they are working with more commitment than men and results show that work in the department of neurology requires more care than other departments.





Differences in the effort and overcommitment considering gender and hospital department of employees in RHS

Results show a good relation in all items, strong negative relation was on reward and ratio efforts-rewards, according to our opinion, this come from the high effort that is not compensated to reward for healthcare workers in RHS.

CONCLUSION

1. The purpose of the present study was to evaluate the ERI model [25] in health care workers (nurses) in the RHS. We conclude that the results of this study that represent the first evidence in favour of the application of the Albanian version of the ERI model in health research, at least in populations with similar socio-economic characteristics is a reliable and psychometrically valid tool for the assessment of asymmetric exchanges between occupational effort and rewards in healthcare workers. The internal consistency of the ERI scales was satisfactory. Controlling for gender, education, and hospital department, ERI showed a significant difference in effort and overcommitment based on gender and hospital department.
2. Our study has limitations, sample was collected from only nurses working in RHS and not in other primary health care clinics in other cities or private health clinics and has not included a sample of doctors, and therefore it was not possible to generalize the conclusions for all doctors and nurses in Albania

Contributors:

Pjetri Emiljano – conceptualization, methodology, formal analysis, visualization, writing – review & editing;

ShabaniZamira – investigation, resources, data curation, writing – review & editing;

Shala Irena – investigation, data curation, resources, writing – review & editing;

Bekteshi Adem – conceptualization, methodology, visualization,formal analysis, writing – review & editing.

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