RESEARCH ARTICLE

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Relationships and Predictors of Resilience, Social Support, and Perceived Stress among Undergraduate Nursing Students

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Abstract:

Background: Nursing students experience high levels of stress. Therefore, they need to have adequate levels of resilience and social support to overcome the negative consequences of perceived stress.

Objective: The objective of the study is to assess the levels, relationships, and predictors of resilience, social support, and perceived stress among Jordanian nursing students.

Methods: A descriptive, cross-sectional design was employed. Data were collected from 150 Jordanian nursing students chosen conveniently using the Connor-Davidson Resilience Scale, Multidimensional Scale of Perceived Social Support, and Perceived Stress Scale (PSS).

Results: The mean total score of resilience was 71.61, with one-third of the participating students being resilient. Results indicated moderate levels of social support and perceived stress. A significant positive correlation was found between resilience and social support, and significant negative correlations were found between perceived stress and resilience and social support. Differences in resilience, social support, and perceived stress were found in regard to some demographics. Also, different independent variables predicted resilience, social support, and perceived stress.

Conclusion: Students reported low levels of resilience and moderate levels of perceived stress and social support. Therefore, conducting programs that aim to improve resilience techniques is crucial for nursing students. Special attention should be directed toward social support, especially from family members.

Keywords: Resilience, Social support, Perceived stress, Nursing students, Jordan, Academic workload, Profession strictness.

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1. INTRODUCTION

University students, including nursing students, face high levels of stress. Nursing students are challenged with many stressors, such as academic workload, exams, doubt about their future profession, strictness during clinical training, competitions with peers, time demands, fear of

making mistakes, and working with different technical and complex equipment [1, 2]. Nursing students experience many emotional and physical adverse conditions due to their theoretical academic demands and because they try to help patients and families during their clinical training [3]. Therefore, they should be equipped with adequate strategies to develop healthy behaviors to overcome the adverse conditions they encounter [4-6]. Levels of perceived stress were found to be high among nursing students. For example, Using the Perceived Stress Scale (PSS), the perceived stress among Hong Kong nursing students was 21.20, while it was 19.90 for all health sciences students [7]. Furthermore, perceived stress was found to be 21.29 among Malaysian nursing students [8].

Resilience is the process of adapting well despite adversity or significant sources of stress. It is the capacity to recover from stressful conditions and the ability to adapt and control the adverse effects of stress [9]. Resilient persons have the ability to develop healthy behaviors and are able to decrease the effects of perceived stressors adequately, can tolerate pressure in adverse situations, and can also obtain benefits from social support [6]. Using Connor and Davidson Resilience scale-25 (CD-RISC-25), the resilience level among Pakistani university students was evaluated, and it was found to be 64.59 [10]. Moreover, it was 72.68 among nurses in Gaza [11] and 61.80 among Iranian nurses [12]. Several factors were found to affect resilience levels among nursing students, such as academic stress and social support [5, 13-16], perceived stress [2, 17-19], life satisfaction and well-being [20-24], and demographic variables, such as age, gender, and year of study [25].

Perceived social support is the awareness of the presence of support from others, which can be received from family members, friends, and significant others [26]. An adequate level of social support increases psychological well-being, self-efficacy, coping, resilience, and self-esteem. Furthermore, a high level of social support decreases the levels of emotional disturbances, anger, hopelessness, stress, anxiety, depression, and submissive behaviors [27-29]. Different demographic variables affect the perception of social support; for example, female nursing students perceived a higher level of social support than males [15, 28]. Several studies measured perceived social support among nursing students and reported high levels of social support (*i.e.*, over 60 on the Multidimensional Scale of Perceived Social Support, MSPSS). For example, perceived social support among nursing students was 62.40 among Egyptian students [30], 64.80 among Malaysian students [31], 65.10 among Turkish students [32], and 68.96 among Nepalese nursing students [33]. In summary, adequate social support and resilience act as a buffer against the negative effects of stress and protect students' psychological well-being [16, 34-36]. Thus, students need to strengthen their resilience abilities and get benefit from the social support provided to them [37].

1.1. Significance and Research Questions

Several studies explored the levels and predictors of resilience, social support, and perceived stress among nurses and university students. Moreover, few studies assess the levels of resilience, social support, and perceived stress among nursing university students. However, there are very few research studies that assess those concepts among Jordanian nursing students. Therefore, this study was conducted to assess the levels, relationships and predictors of those variables in a sample of undergraduate Jordanian nursing students. More specifically, this study aimed to:

1. Assess the levels of resilience, social support, and perceived stress among Jordanian undergraduate nursing students.

2. Examine the relationships among resilience, social support, and perceived stress among Jordanian undergraduate nursing students.

3. Detect any differences in resilience, social support, and perceived stress with selected demographic variables among Jordanian undergraduate nursing students.

4. Assess the predictor variables of resilience, social support, and perceived stress among Jordanian undergraduate nursing students.

2. METHODS

2.1. Design

A descriptive, correlational design was used.

2.2. Instruments

The questionnaire consisted of four parts. The Arabic versions were used.

2.2.1. Demographic Variables

Demographic variables were age, gender, family monthly income, daily sleeping hours, smoking status, taking well-balanced diets, practicing exercise, Grade Point Average (GPA) university academic year, intention to leave nursing, and level of satisfaction with nursing (a scale from 1" strongly not satisfied to 5 "strongly satisfied").

2.2.2. Connor-Davidson Resilience Scale (CD-RISC)

was used to assess resilience level. It consisted of 25 items with responses ranging from 0 (strongly disagree) to 4 (strongly agree). The total score ranged from 0-100, with a higher score representing higher resiliency. This scale distinguished a resilient person from a non-resilient. Resilient people are those who score 80 and above. CD-RISC had good validity and reliability. Cronbach's alpha was 0.89, and the test-retest reliability coefficient was 0.87 [9]. In the current study, Cronbach's alpha was 0.92.

2.2.3. The Multidimensional Scale of Perceived Social Support (MSPSS)

[26] was used to measure perceived social support. It consisted of 12 items representing 3 sources of social support: family, friends, and significant others. Responses

to items ranged from 1 (very strongly disagree) to 7 (very strongly agree). The possible total score was 12-84, with a higher score indicating a higher level of social support. For each subscale, the possible score ranged from 4 to 28. The average items' scores ranged from 1 to 7. A score of 1.0- < 3.0, 3.0 to 5.0, and > 5.0 indicated low, moderate, and high support, respectively [26]. It has good validity and reliability. In this study, Cronbach's alpha was 0.94.

2.2.4. *The Perceived Stress Scale (PSS)*

[38] was used to assess the levels of perceived stress. It comprised ten items with responses ranging from 0 "never" to 4 "very often". The total score ranged from 0 to 40, with higher scores indicating higher stress. A score of 0-13, 14-26, and >27 indicated low, moderate, and high levels of perceived stress, respectively [38]. In the current study, Cronbach's alpha was 0.78.

2.3. Sample

Prior to data collection, G*Power software was used to estimate the minimum required sample size. For a multiple linear regression of 12 variables, using a small effect size (0.15), a power of 0.80, and an alpha of 0.05, the minimum required sample size was 127 [39]. All Jordanian undergraduate nursing students studying nursing in 2022 were invited to participate in the study by completing a survey designed in Google Forms.

2.4. Setting

The setting was all Jordanian universities that offered nursing programs. There are 14 universities that offer a Bachelor's degree in nursing. The Bachelor's nursing education system in Jordan is approximately consistent across all universities and is designed into four academic years with approximately 132 credit hours.

2.5. Ethical Consideration

This study was approved by the Institutional Review Board (IRB) of Hashemite University, where the primary research was conducted (No:9/1/2021/2022). The survey link was sent to nursing deans in each university, and they were asked to post it in college groups. In the introduction, participants were told about the study's purposes and that their participation was voluntary. The introduction also contained a statement regarding informed consent, indicating that filling out and submitting the survey indicated their consent for participation. The confidentiality of data and anonymity of participants were assured and protected.

2.6. Data Collection

Using an online electronic survey (using Google Forms), data were collected from a convenient sample during April, 2022. Students were asked to take part in the study voluntarily. An online invitation to participate in the study was sent to nursing student groups in each university. The online survey was posted on nursing students' groups on official portals and social media (Facebook and Microsoft Teams).

2.7. Data Analysis

Data analyses were performed by the Statistical Package for Social Sciences (SPSS, version 24). Descriptive statistics were used to describe sample characteristics, levels of resilience, social support, and perceived stress. Pearson's correlation coefficient was used to measure the relationships between studied variables. Independent sample t-test and one-way analysis of variance (ANOVA) were used to examine the differences in the mean scores between demographics and the study variables. Multiple linear regression analyses were performed to detect the predictor variables of resilience, social support, and perceived stress.

3. RESULTS

3.1. Demographic Variables

The sample consisted of 150 Jordanian undergraduate nursing students; 60% (n=90) of them were females. Their age ranged from 18 to 23 years (mean=20.00, SD=1.34). The average family income ranged from 220 JD to 3000 JD (mean=655.7, SD=429.94). Few students (n=21, 14.0%) had thoughts of discontinuing nursing studies, and 19 (12.7%) reported being unsatisfied with nursing studies. Other demographic variables are shown in Table **1**.

Table 1. Demographic variables (N=150).

Variable (Range)	Mean	Standard Deviation
Age	20	1.34
Family income per month (Jordanian Dinar)	655.75	429.94
Average daily sleeping hours	6.93	1.62
-	Frequency	Percentage
Gender	-	-
Male	60	40
Female	90	60
Smoking status	-	-
Yes	36	24
No	114	76

(Table 1) contd.....

Variable (Range)	Mean	Standard Deviation
Taking well-balanced diets	-	-
Yes	54	36
No	96	64
Performing physical exercises	-	-
Yes	25	16.7
No	125	83.3
Grade Point Average (GPA)	-	-
Excellent	36	24
Very good	72	48
Good	42	28
University academic year	-	-
First-year	46	30.7
Second-year	61	40.7
Third-year	23	15.3
Fourth-year	20	13.3
Think about leaving the nursing study	-	-
Yes	21	14
No	129	86
Satisfaction with nursing study	-	-
Strongly not satisfied	6	4
Moderately not satisfied	13	8.7
Neutral	27	18
Moderately satisfied	57	38
Strongly satisfied	47	31.3

Table 2. Means and prevalence of resilience, social support, and perceived stress (N=150).

Scale-Mean	Possible Range Score	Mean	SD
Resilience	0-100	71.61	15.71
Social Support	Dec-84	58.18	16.17
Family	28-Apr	18.47	6
Friends	28-Apr	20.27	5.89
Significant others	28-Apr	19.45	6.8
Perceived Stress	0-40	22.32	5.41
-	-	-	-
Scale-Prevalence	-	Frequency	Percentage
Resilience	0-100	-	-
Not resilient	0. to <80	99	66
Resilient	80 to 100	51	34
Social Support	1.0-7.0	-	-
Low	1.0 to < 3.0	12	8
Moderate	3.0 to 5.0	68	45
High	> 5.0 to 7.0	70	47
Perceive Stress	0-40	-	-
Low	0-13	10	6
Moderate	14-26	118	78
High	27 and 40	33	22

Table 3. Correlation among resilience, social support, perceived stress, and demographics (N=150).

Variable	Resilience	Social Support	Perceived Stress
Resilience	1	-	-
Social support	**0.438****	1	-
Perceived stress	**-0.271****	**-0.188***	1
Age	-0.008	-0.085	0.114
Income level	0.15	**0.251****	-0.129
Sleeping hours	0.008	-0.155	-0.115
Gender	-0.029	0.01	0.067
Smoking	-0.157	**-0.203****	0.119
Taking well-balanced diets	**-0.299****	-0.164	**0.276****
Exercise	**-0.175***	-0.106	0.164
Grade Point Average	-0.116	0.022	0.117
Year of study	-0.075	0.044	0.126
Intention to leave	-0.063	0.062	-0.055
Satisfaction in nursing	**0.171***	0.154	-0.122

Note: * Significance at an alpha of 0.05 two-tailed
** Significance at an alpha of 0.001 two-tailed

3.2. Levels of Resilience, Social Support, and Perceived Stress

The total mean score of resilience was 71.61 (SD=15.71). Only 51 (34.0%) students were resilient (scores of 80 and above), and 99 (66.0%) were not (scores of less than 80). Using quartiles, the prevalence of low, moderate, and high resilience levels were: 24.7% (n=37, participants' scores less than 63), 28.0% (n=42, participants' scores between 63-72), and 47.3% (n=71, participants scored above 37), respectively. The total mean score of social support was 58.18 (SD=16.17), and the items' average mean score was 4.84, indicating a moderate level of social support. The highest source of social support was from friends (mean=20.27, SD=5.89). Regarding levels of social support, 8.0%, 45.0%, and 47% had low, moderate, and high levels of social support, respectively, indicating that the highest percentage had moderate to high levels of social support. The total mean score of perceived stress was 22.32 (SD=5.41), indicating a moderate level. Regarding levels of perceived stress, 6.0%, 78.0%, and 22.0% had low, moderate, and high-stress levels, respectively, indicating that the highest percentage of nursing students have a moderate level of stress (Table 2).

3.3. Resilience, Social Support, and Stress: Correlations, Differences, and Predictors

Resilience was positively correlated with social support (r=0.438, P<0.001) and satisfaction with nursing study (r=0.171, p<0.05), and negatively with perceived stress (r=-0.271, p<0.001), taking well-balanced diets (r=-0.299, p<0.001), and performing exercise regularly (r=-0.175, p<0.05) (Table 3). Higher resilience was found among students who were smokers, taking well-balanced diets, performing exercise, and were satisfied with the nursing study (Table 4). Resilience was predicted by one variable (social support) and accounted for 26.2% of the variance

(Table 5). Social support was positively correlated with income level (r=0.251, p<0.001) and resilience (r=0.438, p<0.001) and negatively with perceived stress (r=-0.188, p<0.05) and smoking status (r=-0.203, p<0.001). Higher social support was found among smokers with higher income levels. Social support was predicted by six variables (resilience, age, income, sleeping hours, smoking status, and year of study) and accounted for 29.3% of the total variance. Perceived stress was positively correlated with income level (r=0.276, p<0.001) and negatively with resilience (r=-0.271, p<0.001) and social support (r=-0.188, <0.05). Higher perceived stress was found among students with lower sleeping hours and those not taking well-balanced diets. Perceived stress was predicted by one variable (well-balanced diets), accounting for 11.3% of the variance.

4. DISCUSSION

4.1. Levels of Resilience, Social Support, and Perceived Stress

The results of this study showed that the total mean score of resilience was 71.61 (SD=15.71), with only 34.0% being resilient. There are no studies that measure the overall resilience level among nursing students using CD-RISC-25. However, there are few studies that measured the overall resilience level among university students and nurses [10, 12, 37]. A study that measured resilience among university students found that the level was 64.59 [10], which was lower than our results. Also, studies that measured resilience among nurses found the level to be lower than our results. For example, among Iranian, Turkish, and Pakistani nurses, resilience levels were 61.21, 64.28, and 64.59, respectively [10, 12, 37]. In the current study, the prevalence of low, moderate, and high resilience were: 24.7%, 28.0%, and 47.3%, respectively. Our results were relatively consistent with the results of

Table 4. Demographic differences in resilience, social support, and perceived stress (N=150).

Variable	Resilience		Social Support		Perceived Stress	
-	Mean	p	Mean	p	Mean	p
Age	-	0.121	-	0.13	-	0.06
18-20	72.8	-	59.5	-	21.8	-
21-23	68.4	-	55	-	23.6	-
Income level	-	0.503	-	**0.012**	-	0.869
0-500 JD	70.83	-	55.2	-	22.4	-
501 JD and more	72.6	-	61.8	-	22.2	-
Sleeping hours	-	0.976	-	0.167	-	**0.03**
3-7	71.6	-	59.4	-	22.9	-
8 and more	71.5	-	55.3	-	20.8	-
Gender	-	0.836	-	0.876	-	0.619
Male	71.9	-	58.4	-	22.1	-
Female	71.4	-	58	-	22.5	-
Smoking status	-	**0.048**	-	**0.019**	-	0.063
Yes	76.1	-	63.7	-	20.7	-
No	70.1	-	56.5	-	22.8	-
Taking well-balanced diets	-	**0**	-	0.1	-	**0**
Yes	77.6	-	61.1	-	20.2	-
No	68.2	-	56.6	-	23.5	-
Physical exercises	-	**0.04**	-	377	-	0.124
Yes	77.5	-	60.8	-	20.8	-
No	70.4	-	57.7	-	22.6	-
GPA	-	0.279	-	0.513	-	0.06
Excellent	75.2	-	59.2	-	21.5	-
Very good	70.7	-	56.6	-	22.2	-
Good	70	-	59.9	-	22.4	-
Academic Year	-	0.225	-	0.616	-	0.263
First-year	70.5	-	55.9	-	21.8	-
Second-year	74.3	-	59.9	-	22.1	-
Third-year	71.3	-	60.1	-	21.9	-
Fourth-year	66.2	-	57.1	-	24.5	-
Leave nursing	-	0.368	-	0.147	-	0.508
Yes	74.5	-	53.4	-	23.1	-
No	71.1	-	58.9	-	22.2	-
Satisfaction	-	**0.009**	-	0.125	-	0.429
Not satisfied/neutral	66.6	-	55.1	-	22.8	-
Satisfied	73.8	-	59.5	-	22.1	-

other studies that measure resilience among nursing students using CR-RISC-25. For example, Sahu *et al.* [19] found that the prevalence of low, moderate, and high resilience among Indian nursing students was 19.6%, 59.8%, and 20.6%, respectively. In the same line, the prevalence of resilience among another sample of Indian nursing students was 4.0%, 42.7%, and 53.3% for low, moderate, and high levels of resilience, respectively [40].

Results of this study showed that the total mean score of social support was 58.18 (SD=16.17), which was lower than what was found in most similar studies [14, 27-33]. In these studies, the level of social support among nursing students using MSPSS ranged between 64.0 to 68.9. Results of the current study showed that the highest source of social support comes from friends, then from significant others, and lastly from family members. This is incongruent with what was found in literature, that the highest source of social support comes from family, then friends, and lastly from significant others [14, 28, 29].

Table 5. Multiple regression model predicting resilience, social support, and perceived stress (N=150).

-	B	β	F	p
Predictors of Resilience	**-**	**-**	**-**	**-**
1. Social support	0.397	0.408	5.06	0.000
Model Summary R^2 Adjuster R^2 Total Variance	0.326 0.262 26.2%	-	-	-
Predictors of Social Support	-	-	-	-
1. Resilience	0.412	0.400	6.15	0.000
2. Age	-4.340	-0.360	-	-
3. Income	0.007	0.179	-	-
4. Sleeping hours	-1.790	-0.179	-	-
5. Smoking status	-7.560	-0.200	-	-
6. Year of study	4.560	0.280	-	-
Model Summary R^2 Adjuster R^2 Total Variance	0.350 0.293 29.3%	-	-	-
Predictors of Perceived Stress	-	-	-	-
1. Taking well-balanced diets	2.317	0.206	2.46	0.005
Model Summary R^2 Adjuster R^2 Total Variance	0.191 0.113 11.3%	-	-	-

Note: * Significance at an alpha of 0.05 two-tailed

The results of this study showed that the total mean score of perceived stress was 22.32 (SD=5.41), indicating a moderate level. This result is slightly higher than the results of most studies that found that the perceived stress level among nursing students was around 18.0-20.0. For example, perceived stress was 19.8 among USA students [41], 20.94 among UK students [17], 18.92 among Indian students [42], and 21.29 among Malaysian students [8]. However, very few studies have similar results, such as studies by Onieva-Zafra *et al.* [1] and Mendes *et al.* [18], who found that the perceived stress was 22.78 and 22.68, respectively. It is worth mentioning that two studies found higher levels of perceived stress. Brown and Vargas [13] found it 32.2 among USA students, and it was 27.91 among Singapore students [4].

4.2. Resilience: Correlations, Differences, and Predictors

It is well documented in the literature that both resilience and social support correlated negatively with perceived stress [10, 14, 18, 37, 41, 43]. In a sample of Indian nursing students, a negative correlation (-0.196) was found between resilience and perceived stress [19]. Also, perceived stress correlated negatively with social support (-0.220) among Spanish nursing students [1]. Furthermore, in a study that included UK and Chinese nursing students, perceived stress correlated negatively with resilience (-0.152) [17]. Regarding resilience and

smoking, Wang *et al.* [44] examined the role of negative emotions in mediating the link between stress and smoking and whether it could be modified by resilience. Results confirmed that resilience interacts with stress and negative emotions to affect the risk of tobacco use. Concerning physical activity, studies found that physical activities build up resilience, which, in turn, improves mental health. A study conducted by Ho *et al.* [45] showed that physical activity level was significantly correlated with mental well-being, self-efficacy, and resilience. Moreover, resilience was found to mediate the positive association between physical activity and mental well-being.

4.3. Social Support: Correlations, Differences, and Predictors

The results of this study showed that social support was higher among smokers and students with lower income levels. Results of the current study concerning social support and smoking were congruent with the results found by Yun *et al.* [46], who found that smokers had high levels of social support and social networks as compared to those who are non-smokers; it was also found that the high social support group were likely to be of smokers. One explanation is that university students sit and chat with each other frequently (*i.e.*, as a form of social support) and encourage each other to smoke in an attempt to reduce stress. Also, our results were consistent

with the results of a study conducted by Weyers *et al.* [47], who found that people with lower income levels more often reported poor social networks and social support.

4.4. Perceived Stress: Correlations, Differences, and Predictors

Our results were congruent with the results of a previous study that measured the effect of appropriate dietary habits on both resilience and perceived stress. The researchers pointed out that the appropriate dietary habits (that contain fruits, vegetables, whole-grain products, and plant and animal protein) are necessary for good health and appropriate functioning of the immune system, which, in turn, increase resilience and reduce stress levels [48]. Also, our results regarding the relationship between resilience and perceived stress were consistent with the results found in several studies [10, 13, 17-19, 41]. For example, Brown and Vargas [13] found a strong negative relationship between perceived stress and resilience.

Contrary to what was found in most studies that female students have higher levels of perceived stress compared to their male counterparts [1, 7], our results showed no differences in perceived stress in relation to gender. However, the results of a few studies found no relationship between both perceived stress and resilience in regard to gender [13], which was consistent with the results of the current study. Several studies found a negative relationship between perceived stress and satisfaction with nursing study as a future career [8]; however, in the current study, there were no significant differences between perceived stress and satisfaction in nursing study.

4.5. Limitations and Recommendations

Although this study provides valuable information about resilience, social support, and perceived stress, it has a few limitations. First, a cross-sectional design was employed; therefore, a causal relationship could not be drawn. Longitudinal studies directed toward students in their entire academic years could provide a more in-depth understanding of their resilience, social support, and perceived stress from a developmental point of view. Second, bias and subjectivity may be an issue due to using a survey questionnaire to collect data. Students may respond in a socially desirable manner rather than their actual responses. Lastly, the study included only nursing students, so results cannot be generalized to all Jordanian university students. Future studies may include students from different colleges.

4.6. Nursing Implications

The results of the study highlighted the importance of resilience and social support in reducing and coping with perceived stress. Nursing curricula should contain details about improving resilience among nursing students and enhancing ways of coping with perceived stress. Also, nursing educators and administrators should be aware of the necessity of improving students' psychological health.

Furthermore, nursing researchers are encouraged to conduct interventional studies that foster resilience among nursing students.

CONCLUSION

One-third of the participating students were resilient. Overall, students reported moderate levels of social support and perceived stress. Significant differences were found in resilience, social support, and perceived stress with some demographic and educational variables, such as smoking status, income level, taking well-balanced diets, sleeping hours, performing an exercise, and satisfaction with nursing study. Hence, additional research studies that have more predictor variables are needed. Moreover, studies that measure the impact of specific interventions regarding resilience, social support, and perceived stress are also encouraged.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Review Board (IRB) of Hashemite University, where the primary research was conducted (No:9/1/2021/2022).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data and supportive information are available within the article.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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