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Health Locus of Control and Health Promoting Behaviors among Nursing and Non-Nursing Students in Zagazig University, Egypt

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Abstract: *A solid society arises with healthy youth. University students speak to the future of nations. University is a time of expanded responsibility for choices and healthy practices. Such behaviors could continue into middle and old age to perpetrate health hazards later in life. The existing study aimed to investigate the relation between health promoting behaviors and health locus of control among Zagazig University nursing and non-nursing students, hence, a comparative cross sectional study design was used. A self- administered questionnaire sheet was used to collect data from 1188 undergraduate student. Study results revealed that in terms of health promoting behaviors, nursing students had higher mean score regarding health responsibility, social support and stress management sub items compared to life appreciation, nutrition and exercise among non-nursing. As to health locus of control, internal and powerful others locus was higher among nursing students, while chance sub item mean score was higher among non-nursing students. Conclusion, being nursing or non-nursing student only accounted for a small fraction of variation in health locus of control and health promoting behavior. Taken as whole, believing in health control regardless of its locus is positively correlated with health promoting behaviors among both nursing and non-nursing students. Consequently it is recommended to tailor nursing interventions to encourage healthy behaviors specially nutrition and exercise for nursing students, and health responsibility, and stress management for non- nursing students.*

Keywords: *Health promoting behaviors, Health locus of control, Zagazig University, Nursing students*

I. Introduction

Health promotion is a fundamental prerequisite to community development.[1] Many societies focus on health promotion by classifying it as an investment. Health promotion is defined as a process of enabling people to increase control over and improve their health. This definition moves beyond a focus on individual behavior toward a wide range of potential social and environmental interventions. Various studies and accumulating evidence show that the practice of health promoting behaviors decreases the occurrence of disease and lowers death rate.[2] University students represent the future leaders in organizations, communities and nations. University years are a period where students progressively settle on independent choices about their lifestyle and health behaviors. Moreover, there is probability for development of risky lifestyles, albeit some of these practices may be transient in nature, other practices could lead to health hazards in middle and old life.[3] Health has a vital place in the lives of all people, hence people need to enhance their lifestyle behaviors to improve quality of life and protect their health. Moreover, recent studies have shown that health locus of control is undoubtedly related to illness, and illness related mortality rates.[4]

The health risks that individuals face are significantly influenced by the health behaviors they embrace. Psychologists contend that perceived behavioral control involve two closely related concepts: locus of control and self-efficacy. Locus of control (LOC) is a psychological concept reflecting an individual's whole prospects about the internal versus external control of reinforcement.[5] LOC is a theory of perceived control about the source (locus) of reinforcement to a certain behavior or life experience. Health locus of control (HLOC) related research is founded on the work of Wallston et al. who developed the HLOC Scale in1976, and modified it to a Multidimensional scale in 1978.[6] Multidimensional Health Locus of Control (MHLC) scale is made out of three dimensions which quantify the extent to which individuals believe their health is controlled internally, by chance, and by powerful others as doctors and nurses.[7] The Internal Locus of Control views health as a product of individual choices and lifestyle. The External Locus of Control subdivides into; Chance Locus of Control which views that health is determined by luck, and Powerful Others Locus of Control which views that health is determined by guidance of authorities.[8] It has been recommended that health control affects personal health related behaviors, but the belief of having control may be even more important.[9]

Nurses as professionals are currently the social actors in charge of enormous happenings taking place in the health context. International guidelines highlight the importance of nurses' role in health promotion. Nursing professionals, particularly those working with school and community health, possess the competencies that are crucial to advancing social, personal and cognitive skills in youth. In addition, they are able to assess and focus on the need for more specific interventions within each group of adolescents with the objective of promoting a healthy transition to adult life.[10]

1.1 Significance

The concept of HLOC is defined as an individual's belief system about control over health outcomes.[11] Contained by the framework of Rotter's Social Learning Theory, the construct of HLC assumes that people with an internal HLC have more control over their own health hence; they are more expected to be involved in positive and protective health behaviors. Then again, those with an external HLC believe that their health as out of their control since it is the charge of influential others and accordingly engage in negative and risky health behaviors.[12]

Health promoting behaviors has become an essential feature of many communities, including university students.[13] Nursing students have potential effect on public health and can possibly play an important role in healthcare. Consequently, protecting and promoting their health is one of the key issues in universities. Yet, some studies show that nursing students do not carry out necessary activities for healthy lifestyle and there is limited knowledge on the factors influencing nurses' adoption of healthy life.[14]

1.2. Aim:

The current study aimed to investigate the relation between health locus of control and health promoting behaviors among nursing and non-nursing students in Zagazig University, Egypt.

II. Methodology

2.1. Design:

Comparative cross sectional study design was used to direct the current study.

2.2. Setting:

The present study was carried out in four faculties (Arts, Commerce, Science and Nursing) affiliated to Zagazig University, which is an Egyptian governmental university located in Sharkia governorate (in the east of Nile delta). Zagazig University is the seventh Egyptian university in terms of the history of its creation, and consists of around 19 faculty and institution. The university receives students from the neighboring & distant governorates and countries as well.

2.3. Subjects:

A total of 1188 undergraduate male and female students randomly selected from second and fourth year in the above mentioned faculties. Assuming that moving from secondary education level to university live is considered as a transitional period in students' live, hence, the researchers tried to focus the effect of university live on behavior choices and health locus by enrolling students in the second and the final year of university education. Sample size was estimated by using Epi Info computer software 6. The power of the test was 80% and confidence interval 95%, prevalence of health behavior in Algerian study was 81.9 % [15] and number of Zagazig University students in the academic year 2015-2016 was about 104.000 students, then the calculated sample size was 1188 student.

2.4. Instruments

The researchers prepared a self-administered questionnaire sheet made out of the accompanying parts:

Socio-demographic characteristics [16] the scale included seven domains (Education & culture, Occupation, Family, Family possessions, Economic, Home sanitation, and Health care) with a total score of 84, where a higher score indicating better socioeconomic status. The different domains indicated moderate internal consistency (Cronbach $\alpha = 0.66$) according to the author. Besides a question about the source of health information was inquired.

Adolescent Health Promotion Scale [17] to assess the frequency of certain health promoting behaviors, it was made up of 40 items on five point Likert scale extending from "never" to "always". Such behaviors were distributed among six subscales, which correspond to some areas of behavior: nutrition, social support, health responsibility, life appreciation, exercise, and stress management, the higher the score the higher the frequency of health promoting behaviors. By applying Cronbach α-test it was found that the reliability of the scale was favorable ($\alpha = 0.853$).

The Multidimensional Health Locus of Control (MHLC) Scales [18]. It was categorized to three dimensions (six items for each) of health locus of control: ''Internal'' (IHLC), ''Chance'' (CHLC), and ''Powerful Others'' (PHLC). Each item of the MHLC scales consisted of an item stem (one sentence) designed to elicit respondents' beliefs about who or what controls their health status, followed by a five-point Likert scale, the rating scale corresponding descriptors ranging from 'Strongly Agree' to 'Strongly Disagree'. Scores for the three dimensions were computed by adding the individual item scores for the items comprising each subscale,

higher scores demonstrating higher health LOC for that dimension. By applying Cronbach α-test it was found that the reliability of the scale was $\alpha = 0.67$.

2.5. Field work

The researchers started their work by selecting three faculties randomly (picking from a bowel). Then, A letter containing the aim of the study was issued to the vice dean of student affairs of each of the selected faculty to gain their acceptance for collecting data. By gaining the letter of authorization the researchers reviewed the educational schedule of the selected students. After that, the researcher selected the class rooms randomly and then coordinated with the responsible staff members. Students were approached at either the practical sessions (sections) or lectures in the presence of the staff member to gain more control in the class room. After explaining the purpose of the study the self-administered questionnaires were distributed to students. All students were informed that by completing the questionnaire, they agree to participate in the study. The time consumed to fill out the questionnaire ranged from 15 to 20 minutes. Data collection started from the end of October to the mid of November 2015. A representative sample of students was sought at all participating faculties.

2.6. Pilot study

The pilot study was carried out on 110 (10%) student from the four selected faculty to test for applicability, feasibility, practicability of the tools and time estimated for filling out the questionnaire. Those subjects were excluded from the sample (110 for pilot and 1188 for the study).

2.7. Ethical consideration

Students were informed that an official permission was obtained using proper channels of communication from authorized personal. Their participation is voluntary and anonymous, and they could withdraw at any time of the data collection and ask for their data to be removed. Also they were assured that the information would be confidential and used for the research purpose only.

2.8. Statistical analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 16). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). For comparison between means of two groups of parametric data of independent samples, student t-test was used. For comparison between more than two means of parametric data, F value of ANOVA test was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p<0.05$ for interpretation of results of tests of significance.

III. Results

The total sample of the current study comprised 1188 university student, of which 92 (7.7%) were nursing student and 1096 (92.3%) were non nursing student. Mean age of students was 20.19±1.09 years. Concerning sex, 76.9% were females compared to 23.1% male (χ^2=10.014 & P=0.002). With reference to residence, 60.2% of students belonged to rural areas. As to social class, students occupied either moderate (36.5%) or high (36.5%) social class. Table 1 clarifies that total mean scores of health promoting behaviors among Zagazig university students was 144.20±17.79 for non-nursing students compared to 143.91±15.04 for nursing students; where the highest ranked score was for life appreciation domain with a statistically significant difference (t-test=2.345 & P=0.019) followed by social support and the lowest rank was for nutrition and exercise. Regarding health locus of control, the total mean score was 64.34±8.14 among non-nursing students compared to 64.50±6.59 among nursing students; where the highest ranked score was for internal locus and the lowest was for chance among both groups.

Table 2 classifies Sources of information about health among the studied Zagazig university students (nursing and non-nursing students). As the figure shows audiovisual materials, followed by internet and social media were the common sources of students' information, whereas 52.2% of nursing students compared to 41.1% of non-nursing students seeked health information from printed media the result which is statistically significant (χ^2= 4.020 & p= 0.045) Table 3 simplifies students' health promoting behaviors & health locus of control in relation to socioeconomic level. The table reveals a statistically significant relations between adopting health promoting behaviors as nutrition, health responsibility & exercise and being belonged to high social class (P=0.0001). Concerning health locus of control, the highest total mean score (64.62±8.17) was among students belonged to moderate level social class.

Table 4 highlights students' health promoting behaviors & health locus of control in relation to sources of health information. The table clarifies that the highest total mean score of health promoting behaviors (146.02±17.92) was among students who used the printed media as a sources of health information, this result was found statistically significant (P=0.001). The table also reveals that the highest total mean score of health locus of control was among students who used the printed & social media as a source of health information (64.42±8.27 & 64.52±7.89 respectively). With consideration to the relation between sex and health promoting behaviors and health locus of control, Table 5 high spots that male students have higher total mean scores in both health promoting behaviors (151.68±19.27) and health locus of control (65.96±8.44) where internal locus was the highest with a statistically significant difference (p= 0.0001). As regards the Correlation between scores of health promoting behaviors and scores of health locus of control, Table 6 concludes a statistically significant positive correlation between all the sub items and the total score of health promoting behavior and health locus of control (r= 0.363 and p=0.0001)

IV. Discussion

The current study findings indicated that slightly higher than three quarters of study participants were females, possible explanation of this result is the female students' commitment to attend educational classrooms compared to their male counterparts. Also economic conditions might force some male students to absentee to work and secure money to themselves or their families. In the same stream, the results of study conducted in Jordan to assess Health promoting lifestyles of Jordanian university students by **Al-Khawaldeh** [19] revealed that two thirds of the participants were females. Considering health promoting behaviors scores among non-nursing students, the total mean score was 144.20±17.79, where the highest scored subscale were life appreciation, nutrition and exercise. Such result may be attributed to students' social class (where more than one third belonged to high social class). Also being a university student is a time of appreciating life as well it's a time of energy, activity and fashion so many students seek ideal bodies so they adhere to exercise or nutritious food regimens. In the contrary **Shaheen et al.** [20] research findings revealed that the total mean score of health promoting behavior of university students in Jordan was 127.87± 19.91, where the poorly scored subscales were in physical activity, stress management, and nutrition.

As regards health promoting behaviors among nursing students the results of the current study revealed that the total mean score was 143.91±15.04 (range 103-176). The highest mean scores were on health responsibility, social support and stress management subscales. This result can be explained from the type of study context as nursing curriculum and practice usually focus on such points. Also nursing students schedule usually full, so they have not enough time for adequate nutrition or sports. The same point is supported by **Noh and Lim** [21] who stated that university nursing students had an excessive workload compared to other university students, for the reason that they must acquire expert knowledge and skills. Such result is higher than the results of study conducted in Jordan by **Nassar and Shaheen** [22] which revealed that nursing students practiced health promoting behaviors at a moderate level (M ± SD= 127.24 ± 21.03 & range= 53 - 189). The same study also revealed a contradictory result regarding subscales where nursing students had the highest score on spiritual growth subscale. In the same line with the current study results, **Wittayapun et al.** [23] in Thailand found that exercise and nutrition scores were lower among nursing students. Also **Polat et al.** [24] in Turkey found that exercise was lower than other subscales among nursing students.

As to the students' source of health information, the majority of students seeked information from audiovisual aids, while printed media was the lowest seeked source. Although, the highest total health promoting behavior score (146.02±17.92) was among students seeked health information from printed media with a statistically significant difference (F=28.215 & P= 0.001). Such result might be attributed to the accuracy of printed media information as it is written deliberately and refined several times before publication. Also those individuals who are interested in printed media generally appear open minded and make wise health choices.

Concerning the relation between socio-economic level and health locus of control, the present study results revealed that the mean score of the internal locus was higher among students belonged to middle social class (23.36±3.16), while the mean score of the external locus was higher among students belonged to high social class (22.48±4.04). Possible explanation of this finding is that having limited monthly income forces families to set healthy behaviors as delayed priority so its members should have internal control over their health to avoid extra financial burdens. On the other hand, students belonged to higher social class can easily seek health related or medical advice easily so they can depend on powerful others as physicians or nurses. Controversy, **Serin et al.** [25] found that Turkish students who belonged to medium socio economic levels were externally controlled and students who belonged to high socio-economic level were internally controlled. With regard to the relation between socio-economic level and health promoting behaviors total score, the existing study results displayed that students belonged to higher social class had the highest total mean score (146.63±17.89) with a statistically significant relation (P= 0.0001) especially in the nutrition, exercise, and health responsibility subscales. Such result may be attributed to the power of family members' educational which guide the behavior of its members,

and the power of money to buy nutritious food, membership in sporting club or gym. Congruently, **Shaheen et al.** [20] in Jordan found a significant positive correlation between family monthly income and the average score of all health promoting behaviors subscales.Considering the participants' sex, higher total value of health-promoting behaviors was found among male students specifically in the life appreciation, stress management and exercise subscales the result which was statistically significant (t= 3.797 & P= 0.0001). Such differences between males and females may be attributed to diverse opportunities for practicing outdoor sport in the Egyptian society for males than females where physical activities are always reflected as masculine events; exercise in turn support the idea of managing stress and venting emotions. Similarly the results of study conducted in China by **Lee and Loke** [26] revealed that male students were more likely than female students to execute stress-management.

Considering the relation between sex and health locus of control sub items, the current study results revealed that the highest cited mean score of locus of control was for internal locus (23.67±3.19) among male students with a statistically significant difference (t= 2.665 & p= 0.008). Consistent with previous study findings [25] who found that Turkish male students had higher internal control than females (t=4,890 p<0,001). Regarding the relation between sex and health locus of control total score, the present study results clarified that the total mean score of health locus of control was higher among male students (65.96±8.44) with a statistically significant difference (t= 3.797 & p= 0.0001). Dislike to Iranian researchers [27] who found that girls stand higher than boys in respect of the variable to be investigated. Such discrepancy between results might be attributed to health environment, type of services provided by health care systems, or the individual priority for health behaviors.

V. Conclusion

In the light of the current study results it can be concluded that; nursing students had slightly higher health locus of control, while adopting health promoting behaviors was slightly higher among non-nursing students. In other words, being nursing or non-nursing student only accounted for a small fraction of variation in health locus of control and health promoting behavior. Taken as whole, believing in health control regardless of its locus is positively correlated with health promoting behaviors among both nursing and non-nursing students.

VI. Recommendations

Attention should be paid to health promoting behaviors adopted by university students. Nursing interventions should be tailored to encourage healthy behaviors specially nutrition and exercise for nursing students, and health responsibility, and stress management for non- nursing students, in addition, raising awareness of university students about the dimensions of having control over health.

Table 1: Mean scores of health promoting behaviors and Health locus of control among studied Zagazig university nursing and non-nursing students (n=1188).

Health promoting behaviors	Ranked order	No. of items	Non nursing students (n=1096)	Nursing students (n=92)	Total (n=1188)	t-test P
		Range	Range Mean±SD	Range Mean±SD	Range Mean±SD	
A-Nutrition	5	6 (6-30)	8-30 21.35±3.83	8-28 21.14±3.36	8-30 21.33±3.80	0.511 0.609
B-Social support	2	7 (7-35)	11-35 26.55±3.79	18-33 26.69±3.04	11-35 26.57±3.73	0.345 0.730
C-Health responsibility	4	8 (8-40)	9-40 29.11±5.55	16-39 29.93±4.90	9-40 29.17±5.50	1.387 0.166
D-Life appreciation	1	8 (8-40)	12-40 33.34±5.11	17-40 32.04±5.11	12-40 33.24±5.12	2.345 0.019*
E-Exercise	6	5 (5-25)	5-25 11.91±5.16	5-23 11.40±4.21	5-25 11.87±5.10	0.927 0.354
F-Stress management	3	6 (6-30)	7-30 21.92±3.97	14-30 22.69±3.70	7-30 21.98±3.96	1.799 0.072
Total		40 (40-200)	82-200 144.20±17.79	103-176 143.91±15.04	82-200 144.18±17.59	0.150 0.881
A-Internal	1	6 (6-30)	11-30 23.19±3.28	16-26 23.44±2.75	11-30 23.21±3.25	0.716 0.474
B-Chance	3	6 (6-30)	8-30 18.93±4.08	11-26 18.13±3.52	8-30 18.87±4.04	1.824 0.068
C-Powerful others	2	6 (6-30)	7-30 22.22±3.90	14-30 22.92±3.44	7-30 22.27±3.87	1.671 0.095
Total		18 (18-90)	38-90 64.34±8.14	46-78 64.50±6.59	38-90 64.36	0.177 0.860

*Significant (P<0.05)

Table 2: Sources of health information among Zagazig university nursing and non-nursing students (n=1188).

Sources of health information	Non nursing students (n=1096)		Nursing students (n=92)		Total (n=1188)		χ^2	P
	n	%	n	%	n	%		
• Audiovisual (radio, TV)	960	87.6	84	91.3	1044	87.9	1.099	0.296
• Internet	614	56.0	53	57.6	667	56.1	0.087	0.768
• Printed media (Books, magazines)	454	41.4	48	52.2	502	42.3	4.020	0.045*
• Social media Communication websites	520	47.4	49	53.3	569	47.9	1.150	0.283
• Physicians	6	0.5	0	0	6	0.5	0.506	0.477

*Significant (P<0.05)

Table 3: Relation between socio-economic levels and students' health promoting behaviors and health locus of control (n=1188).

Variables	Socio-economic levels			F value	P
	Low level (n=320)	Moderate level (n=434)	High level (n=434)		
	Mean±SD	Mean±SD	Mean±SD		
Health promoting behaviors sub items: A-Nutrition	20.24±3.82	21.46±3.69	22.12±3.68	24.753	0.0001*
B-Social support	26.49±3.81	26.69±3.67	26.51±3.74	0.334	0.716
C-Health responsibility	27.66±5.16	29.55±5.52	30.06±5.52	20.434	0.0001*
D-Life appreciation	33.08±5.06	33.20±5.07	33.42±5.23	0.461	0.630
F-Exercise	10.96±5.06	12.20±4.96	12.31±5.17	8.156	0.0001*
G-Stress management	21.38±3.99	22.27±3.94	22.20±3.90	5.820	0.003*
Total	139.82±16.62	145.37±17.42	146.63±17.89	16.312	0.0001*
Health locus of control sub items:					
A-Internal	22.98±3.34	23.36±3.16	23.26±3.24	1.410	0.245
B- Chance	19.18±3.82	18.97±4.12	18.51±4.13	2.811	0.061
C- Powerful others	22.02±3.90	22.28±3.66	22.48±4.04	1.356	0.258
Total	64.18±7.71	64.62±8.17	64.26±8.16	0.336	0.714

*Significant (P<0.05)

Table 4: Relation between sources of health information and students' health promoting behaviors and health locus of control in relation (n=1188).

Sources of information about health	Total health promoting behaviors scores	Total health locus of control scores
	Range Mean±SD	
Sources of information about health:		
Audiovisual (radio, TV)	143.57±17.50	64.30±7.91
Internet	145.36±17.76	64.31±7.95
Printed media (Books, magazines)	146.02±17.92	64.42±8.27
Social media (Communication websites)	145.75±17.29	64.52±7.89
Doctors	138.83±9.89	63.50±7.34
F value	28.215	2.039
P	0.001*	0.691

*Significant (P<0.05)

Table 5: Relation between sex and students' health promoting behaviors and health locus of control (n=1188).

Variables	Sex		t-test	P
	Females (n=913)	Males (n=275)		
	Range Mean±SD	Range Mean±SD		
Health promoting behaviors sub items:				
A-Nutrition	20.88±3.73	22.85±3.62	7.746	0.0001*
B-Social support	26.48±3.59	26.84±4.17	1.404	0.161
C-Health responsibility	29.14±5.38	29.26±5.89	0.313	0.755
D-Life appreciation	32.90±5.07	34.40±5.14	4.282	0.0001*
F-Exercise	10.65±4.23	15.93±5.61	16.705	0.0001*
G-Stress management	21.86±3.85	22.40±4.27	1.995	0.046*
Total	141.91±16.40	151.68±19.27	8.303	0.0001*
Health locus of control sub items:				

A-Internal	23.07±3.25	23.67±3.19	2.665	0.008*
B- Chance	18.65±3.93	19.58±4.33	3.332	0.001*
C- Powerful others	22.14±3.84	22.71±3.95	2.136	0.033*
Total	63.87±7.84	65.96±8.44	3.797	0.0001*

*Significant (P<0.05)

Table 6: Correlation between scores of health promoting behaviors and scores of health locus of control among the studied Zagazig university students (n=1188).

Scores of Health promoting behaviors sub items	Internal	Chance	Powerful others	Total scores
	r P	r P	r P	r P
A-Nutrition	0.143 0.0001*	0.063 0.030*	0.162 0.0001*	0.168 0.0001*
B-Social support	0.171 0.0001*	0.135 0.0001*	0.160 0.0001*	0.214 0.0001*
C-Health responsibility	0.233 0.0001*	0.064 0.028*	0.230 0.0001*	0.237 0.0001*
D-Life appreciation	0.182 0.0001*	0.145 0.0001*	0.173 0.0001*	0.230 0.0001*
F-Exercise	0.169 0.0001*	0.203 0.0001*	0.187 0.0001*	0.261 0.0001*
G-Stress management	0.258 0.0001*	0.147 0.0001*	0.222 0.0001*	0.285 0.0001*
Total scores	0.300 0.0001*	0.196 0.0001*	0.295 0.0001*	0.363 0.0001*

*Significant (P<0.05)

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