

## The Relationship between Work Design and Staff Nurses' Creativity

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### Abstract

**Background:** Health care organizations that need to achieve excellence and development in today's competitive world should concentrate on developing constructive work design to optimize staff nurses' creativity to confront challenges of work environment. **Aim:** To examine the relationship between work design and staff nurses' creativity. **Research design:** A descriptive correlational design was applied. **Subjects and setting:** A convenient sample of 300 nurses were included in this study classified as 160 nurses in surgical care units and 140 nurses in medical care units of the Alexandria Main University Hospital. **Tools:** Two tools were utilized namely Work Design Questionnaire (WDQ) and Reisman Diagnostic Creativity Assessment scale (RDCA). **Results:** The study results showed that more than half of nurses (52.7%) perceived high mean score percentage (68.18%) of overall work design, the majority of studied nurses (92.3%) perceived high mean score percentage of creativity (82.49%) **Conclusion:** The study concluded that there was statistically significant weak relationship between work design and staff nurses' creativity ( $r=0.197^* p=0.001^*$ ). **Recommendations:** So, hospital nursing administrators should develop workshops and training programs for managers, team leaders, policymakers, and staff nurses to improve work design-related knowledge, skills, abilities, and motivation and enhance staff nurses' creativity and creative problem solving.

**Keywords:** Work Design, Staff Nurses, Creativity

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### Introduction

In today's human resources management, work design is very important since it is regarded as a useful instrument for addressing staff nurses' requirements and advancing health care organizations' objectives (Ali et al., 2019). In order to remain competitive, health care organizations ought to concentrate on developing a positive work environment that allows staff nurses to advance their careers, boost output, and express their creativity (Weilinghoff, 2016; Anser et al., 2022; Elewa & El Banan, 2022).

Work design is viewed as "the content and structure of one's activities, job tasks, responsibilities, and relationships". Both the nature of the task and the job's qualities are included Parker (2014). It has a significant role in fostering creativity through high levels of internal work motivation and in assisting staff nurses in performing at the maximum level possible (Ali et al., 2019). In the healthcare organization, work design also helps staff

nurses feel more satisfied, reduces absenteeism, boosts productivity, and helps them adjust to changes (Montañez-Juan et al., 2019; Saber et al., 2019).

Creativity practices are essential in today's competitive world for staff nurses to survive and succeed as well as for health care organizations to achieve excellence and development, particularly in the context of global growth, high demand, and limited human resources supply (El-Guindy et al., 2022). Yoo et al. (2019) view creativity as "the capacity to produce novel and practical ideas through the application of creative thinking based on expert knowledge obtained from carrying out one's job". Furthermore, Awad et al. (2021) defined Staff nurses' creativity as "the ability to generate, discover, or produce novel ideas, even by rearranging or reshaping of what they already know". Additionally, nursing care creativity refers to using new ideas and methods

to generate new concepts that must be safer, more effective, and helpful in order to support clinical decision-making. Moreover, financial security, social advancement, satisfied nurses, and thriving health care organizations are all advantages of creativity (Cheraghi et al., 2021; Ghelichkhani et al., 2022; Helaly & El-Sayed, 2022).

### ***Study Aim***

This research aims to examine the relationship between work design and staff nurses' creativity.

### ***Research Question***

Is there a relationship between work design and staff nurses' creativity?

### ***Materials and Method***

#### ***Materials***

#### **Research design:**

A descriptive correlational design was utilized to carry out this research.

#### **Setting:**

This research was carried out in all inpatient medical Units (24 units) as well as surgical units (16 units) at Alexandria Main University Hospital.

#### **Subjects**

Out of 315 staff nurses of total population, 300 staff nurses were the target population using convenience sampling and based on the inclusion criteria of having 6 months experience and being available during data collection, providing direct and indirect care to patients and working in the units that were previously stated, distributed as follows: (140) in medical units and (160) in surgical units.

#### **Tools**

Three tools were utilized to gather the data required for this research.

### **Tool one: Personal and work-related data Questionnaire:**

Sociodemographic data was formulated by the investigator; it involved questions on age, marital status, gender, educational level, work status, years of experience in the working unit, as well as years of experience in the hospital.

### **Tool two: The Work Design Questionnaire (WDQ):**

This tool was developed by Morgeson & Humphrey (2006) and validated by Morgeson (2015) to assess work nature and job design factors. It consisted of four main dimensions with (77 items) namely: knowledge characteristics (20 items), task characteristics (24 items), work context (14 items) and social characteristics (19 items). It was adopted by the researcher and responses of the subjects were measured using five-point Likert scale ranged from (1) strongly disagree to (5) strongly agree. Negative statements were given a reverse score. The overall score ranged from (77-385), low scoring ranged from (77-179), indicated low staff nurses' perception regarding work nature and job design elements, moderate scoring ranged from (180-282), revealed moderate staff nurses' perception regarding work nature and job design elements and high scoring ranged from (283-385), indicated high staff nurses' perception regarding work nature and job design elements.

### **Tool three: "Reisman Diagnostic Creativity Assessment Scale" (RDCA):**

This instrument was developed by Reisman et al. (2016) to measure staff nurses' self-perception on the creativity factors. It consisted of eleven main dimensions with (40 items) namely: originality (6 items) ; Elaboration (4 items) ; flexibility (3 items) ; fluency (3 items) ; tolerance of ambiguity (3 items) ; divergent thinking (3 items), resistance to premature closure (4 items), intrinsic motivation (4 items) convergent thinking (3 items), extrinsic motivation (3 items) and risk taking (4 items). It was adopted by the researcher and to facilitate responses. It was adapted from six to three-point Likert scale ranged from (1) disagree to (3) agree. The overall score ranged from (40-120), low scoring of creativity ranged from (40-66), indicated that staff nurses had low

creativity level, moderate scoring of creativity ranged from (67-93), indicated that staff nurses had moderate creativity level and high scoring of creativity ranged from (94-120), indicated that staff nurses had high creativity level.

### **Method**

- An approval from the Research Ethical Committee (REC), Faculty of Nursing, Alexandria University was received for carrying out the study.
- An official permission was received from Dean of Faculty of Nursing, Alexandria University to carry out the study.
- A written approval was received from hospital administrative authorities of Alexandria Main university Hospital after describing the objective of the study to gather the necessary data.
- Study instruments were translated into Arabic, back-to-back translation (Arabic-English) was performed.
- A jury of five experts in the research field examined the study tools to determine their content validity. Content validity of the tool was assessed. The results of the two tools revealed that total CVI of work design tool (0.913) and total CVI of creativity tool (0.933).
- **Reliability analysis:** Cronbach's alpha coefficient test was used to evaluate the study instruments' internal consistency. The two tools' results showed that they are reliable. Work design tool (tool I) was highly reliable with value  $r=0.927$ , creativity tool (tool II) was reliable with value  $r=0.760$ .
- **A pilot study** including 10 % of nurses (N=30) was conducted to verify and validate the tools' applicability, feasibility and clarity as well as to identify potential obstacles and issues during gathering data.

### **Data collection**

- Data were gathered from the study subjects using self-administered questionnaire. After outlining the purpose of the research. It was personally given to the study participants at the workplace. The needed instructions were given by the researcher.

- The questionnaire was filled out in front of the researcher to guarantee their objectivity, prevent bias in their opinions, and make sure every question was answered completely and accurately.
- For completion of the questionnaire, each study subject consumed approximately from 20- 25 minutes. Gathering data took about two months starting from 19/11/2023 to 19/1/2024.

### **Statistical analysis**

- Data was coded and entered into computer-readable format.
- Data were checked and verified for accuracy after entry.
- The collected data were analyzed with the statistical package for social science (SPSS) version 23.
- The statistical analysis techniques listed below were applied:
  - The following were examples of **descriptive statistical measures:** mean, standard deviation (SD), percentages, and numbers.
  - Tests for **analytical analysis** included regression, ANOVA, Pearson correlation coefficient, Chi square, and student T test.

### **Ethical Considerations**

- Written informed consent from the participants was granted after describing the objective of the study.
- Confidentiality of the data was ensured.
- Anonymity of the participants was assured.
- The participants' right to withdraw from the research at any time was emphasized.

### **Results**

#### **Demographic characteristics of nurses working in medical and surgical inpatient care units.**

Table 1 demonstrates the demographic characteristics of nurses under study; as can be seen the majority of nurses (83.0%) were females and 17.0 % were males. Furthermore, the age group of 30 to less than 40 years old had the highest percentage of nurses (32.7%), 33.6% in medical units and 31.9% in surgical units. Moreover, more than two thirds (68.7%) of nurses were married and 25.0% of them were single. While, those widowed and divorced nurses constituted 3.7% and 2.7 of them respectively. Regarding the level of education, 49.2% of nurses had secondary school diploma, 37.7% and 13.1% of them had technical institute of nursing and bachelor's degree respectively. Additionally, more than half (59.7%) of nurses had more than or equal 15 years of experience in nursing. While, 5.0% of them had less than one year experience in nursing. Also, less than half (44.3%) of nurses had more than or equal 15 years of working in the unit. whereas 4.0% of them had 10 to less than 15 years of experience. Finally, more than half (56.3%) of nurses had work status from 36 to 40 hours per week, while 21.7% of them had work status more than 40 hours per week.

#### **Staff nurses' perception of work design characteristics.**

Table 2 shows that the mean score percentage of overall work design was high  $68.18 \pm 10.97$  presented as  $67.54 \pm 10.15$  in medical units and  $68.74 \pm 11.64$  in surgical units. In particular, the highest mean score percentage of work design dimension was related to task characteristics  $71.97 \pm 12.12$  followed by knowledge characteristics  $71.45 \pm 12.30$  with significant difference where ( $p = 0.036^*$ ) presented as  $69.87 \pm 11.67$  in medical units and  $72.84 \pm 12.69$  in surgical units. While, the lowest mean score percentage of work design dimension was related to social characteristics  $63.76 \pm 14.11$ .

#### **Staff nurses' perception of creativity factors.**

Table 3 illustrates that the mean score percentage of nurses' overall creativity level was high  $82.49 \pm 11.56$  presented as  $83.15 \pm 12.68$  in medical unit and  $81.92 \pm 10.48$  in surgical unit. In particular, the highest mean score percentage

of staff nurses' creativity dimension was related to resistance to premature closure  $89.75 \pm 15.03$ . Whereas, the lowest mean score percentage of nurses' creativity dimension was related to risk taking  $75.46 \pm 20.30$ .

#### **Correlation between work design and staff nurses' creativity.**

Table 4 demonstrates that there was statistically significant positive weak correlation between work design and creativity where ( $p = 0.001^*$   $r = 0.197$ ).

#### **Multivariate analysis linear regression shows the effect of work design dimensions on creativity.**

Table 5 reveals that there was a statistically significant relationship between work design characteristics namely; knowledge characteristics; task characteristics; work context and social characteristics as independent variable and creativity as dependent variable where  $p = 0.003^*$ . Also work design characteristics is a predictive for creativity by 53%.

#### **Multivariate analysis linear regression shows the effect of overall work design on creativity.**

Table 6 portrays that there was statistically significant positive correlation between overall work design and creativity where  $p = 0.001^*$ . Moreover, the coefficient in the regression equation is ( $B = 0.208$ ). It means that work design increases by one unit, creativity increases by 0.208 unit.

#### **Discussion**

Health care organizations seeking to maintain their competitiveness should support staff nurses' creativity through developing effective work design. Nurses that work in well-designed work are more likely to participate, contribute, and perform efficiently because they devote all of their focus to their task (Elewa & El Banan, 2022). In light of the study's findings, this could be clarified. Thus, the study aimed to examine the correlation between work design and staff nurses' creativity.

In this respect, the current study revealed that (52.7%) of nurses perceived high mean score

percentage level (68.18%) of overall work design as well as its four dimensions namely; knowledge characteristics; task characteristics; work context and social characteristics. This may be attributed to nature of work environment which characterized by stability, supportive colleagues, adequate resources and access to ongoing professional development opportunities. Moreover, receiving frequent feedback, have clear role and responsibilities, have more autonomy and control over their work tasks and schedules and feel appreciated and recognized for their contribution to patient care.

This result is supported by Ali et al. (2019) and Elewa and El Banan (2022) who pointed out that nurses have high perception of work design and its related dimensions. On the other hand, this study contradicts a study done in Egypt at Assiut University Hospital by Mohamed and Morsy (2016), who found that study participants had lower score levels regarding domains of work design, which included knowledge, social, and work context characteristics. Also, Ahmed et al. (2024) concluded that (37.5%) of nurses had moderate perception of work design.

In addition to, the highest mean score percentage of work design dimension was task characteristics (71.97%). From the researcher point of view, it may be because nurses have jobs that involve different and meaningful tasks that impact others' lives inside and outside hospital, complete entire task from beginning to end, have opportunity for autonomy over work methods, decision making and work scheduling, and receive frequent feedback on their work activities.

In the same line, results from a study done by Mohamed and Morsy (2016) pointed out that more than half of participants have high perception of task characteristics domain.

Inconsistent with the study results, a study done by Ali et al. (2019) revealed that social characteristics were the most prevalent indicators of work design. Also, Elewa and El Banan (2022) revealed that staff nurses perceived nearly the same mean percentage regarding all domains of work design. Furthermore, Ahmed et al. (2024) asserted that

more than one third of nurses had high perception of knowledge characteristics, whereas more than one third of them had low perception of work context.

As regards staff nurses' perception of their level of creativity, the findings of this study found that the majority of staff nurses (92.3%) perceived high mean score percentage level of creativity (82.49%) as well as its dimension namely fluency, originality, flexibility, tolerance of ambiguity, elaboration, convergent thinking, resistance to premature closure, divergent thinking, extrinsic motivation, intrinsic motivation and risk taking. This may be attributed to presence of positive work environment that characterized by clarity of roles and responsibilities and teamwork. moreover, managers and supervisors at Alexandria Main University Hospital serve as a creative model and empower and support staff nurses by responding to their inquiries, providing them with suggestions, constructive feedback and information as well as stimulating enthusiasm about the work to be accomplished and listening to them. Furthermore, the health care environment is dynamic so nurses must be adaptable to new technologies and procedures. This adaptability encourages nurses to think creatively.

The current study's result was in line with Awad et al. (2021) who highlighted that the majority of staff nurses had a high level of creativity. Also, Helaly and El-Sayed (2022) found that (49%) of nurses under study had high creativity level. Furthermore, Kasasbeh et al. (2014) and Abdelmoamen et al. (2023) revealed that the staff had a high level of creativity.

The current study's finding was inconsistent with El-Seidy et al. (2021) who concluded that more than half of studied nurses had a low level of creativity. Also, Abd-Elrhman & Ghoneimy (2018) revealed that the majority of studied nurses perceived a low level of creativity. Moreover, Tabarestania et al. (2014) showed that studied nurses perceived moderate level of creativity. Furthermore, Saleh et al. (2013) declared that (79.3%) of studied nurses were less than average level of creativity. Drafaehl (2020), found that the nursing students had low level of creativity.

The present study finding revealed that the highest mean score percentage of staff nurses' creativity dimension was related to resistance to premature closure. From the investigator's point of view, it may be because of nature of staff nurses' work which involves caring for patients with various health issues, backgrounds and beliefs. This necessitates an open-minded approach to cope with these challenges.

Whereas, the lowest mean score percentage of staff nurses' creativity dimensions was related to risk taking. It may be due to numerous factors at the study hospital like hospital culture that discourages taking risks, strict guidelines and protocols to ensure patient quality of care and safety and accountability of staff nurses for their actions and decisions so, the high level of accountability in nursing encourages a culture of caution and accuracy, prohibiting unwarranted risks that could jeopardize patient care.

On the contrary Daemi and Moghimi Barforoosh (2004) in their study revealed that the highest mean score percentage of staff nurses' creativity dimension was related to fluency and medium mean score percentage of staff nurses' creativity was linked to the flexibility. Also, Abd-Elrhaman & Ghoneimy (2018) concluded that the majority of studied nurses perceived low level in all elements of creativity. Moreover, Tabarestania et al. (2014) revealed that the highest level of nurses' creativity was related to fluency and the lowest level nurses' creativity was related to elaboration.

Concerning the relationship between work design and staff nurses' creativity; it is remarkable that there was statistically significant positive weak relationship between the overall work design and overall staff nurses' creativity. Also, work design characteristics as an independent variable is predictive for creativity as dependent variable by 53%. These results may be attributed to nurses work in well-designed work that high in motivational, knowledge, social and work context characteristics like social support, autonomy, feedback, variety of skills and tasks and moderate in job demands like role conflict, role ambiguity and workload. Such work designs increase intrinsic motivation of staff nurses to come up with new and creative ideas and methods and lead to higher levels of creativity and innovation.

The result of this study was consistent with the study carried out by Shalley et al. (2004) and Morgeson and Humphrey (2008) which revealed that creativity is one of the behavioral results of work design. Moreover, Ohly (2018) clarified that work design characteristics is one of the factors affecting creativity.

Furthermore, Cai et al. (2019) concluded that well designed jobs enable employees to feel more excited and interested to achieve higher level of creativity. Coelho and Augusto (2010) found that job characteristics (variety, identity, feedback and autonomy) have positive main influences on creativity and each characteristic includes a variety of cognitive processes, each has a distinct way of affecting creativity through domain-relevant skills and intrinsic motivation.

Inconsistent with this study findings, a study done by Elewa and El Banan (2022) who found that there was no statistically significant correlation between studied nurses' perception of work design and their perception of innovative work behavior.

## Conclusion

The results of this research revealed that there was statistically significant positive weak relationship between work design and staff nurses' creativity ( $r= 0.197^*$   $p= 0.001^*$ ).

## Recommendations

In line with the study's results, the subsequent suggestions are presented and directed to different levels of hospital nursing administrators and staff nurses.

### Hospital nursing administrators should:

- 1- Conduct training programs and workshops for managers, team leaders, policymakers, and staff nurses to improve work design-related knowledge, skills, abilities, and motivation and to enhance staff nurses' creativity and creative problem solving.
- 2- Support work environment through providing adequate preparations and resources to stimulate the creativity of staff nurses.
- 3- Implement an effective system for rewarding creative nurses like prizes, flexible working hours and bonuses.

### Staff nurses should:

- 1- Attend workshops, conferences and training programs frequently to improve work design- related knowledge, skills, abilities, and motivation and to enhance their creativity skills.
- 2- Enhance interpersonal relationship with their colleagues to support and provide each other with frequent feedback and encourage open exchange of creative ideas and solutions.
- 3- Work in multidisciplinary nursing teams rather than work individually.

**Further researches need to be examined**

- 1- Examine the relationship between work design and job performance among nursing staff.
- 2- Examine factors affecting staff nurses' creativity.
- 3- Examine the relationship between work design and job performance among nursing staff.

**Table (1): Demographic characteristics of nurses working in medical and surgical inpatient care units**

Demographic characteristics	Medical Units (n=140)		Surgical units (n=160)		Total (n=300)	
	No.	%	No.	%	No.	%
<b>Sex</b>						
• Male	28	20.0%	23	14.4%	51	17.0%
• Female	112	80.0%	137	85.6%	249	83.0%
<b>Age (years)</b>						
• <30	22	15.7%	7	4.4%	29	9.7%
• 30-	47	33.6%	51	31.9%	98	32.7%
• 40-	35	25.0%	49	30.6%	84	28.0%
• ≥50	36	25.7%	53	33.1%	89	29.7%
<b>Marital status</b>						
• Married	82	58.6%	124	77.5%	206	68.7%
• Single	46	32.9%	29	18.1%	75	25.0%
• Widow	7	5.0%	4	2.5%	11	3.7%
• Divorced	5	3.6%	3	1.9%	8	2.7%
<b>Level of education</b>						
• Bachelor degree	23	16.8%	16	10.0%	39	13.1%
• Technical institute diploma	57	41.6%	55	34.4%	112	37.7%
• Secondary school diploma	57	41.6%	89	55.6%	146	49.2%
<b>Years of experience in nursing</b>						
• <1	11	7.9%	4	2.5%	15	5.0%
• 1-<5	28	20.0%	20	12.5%	48	16.0%
• 5-<10	15	10.7%	17	10.6%	32	10.7%
• 10-<15	14	10.0%	12	7.5%	26	8.7%
• ≥15	72	51.4%	107	66.9%	179	59.7%
<b>Years of experience in working unit</b>						
• <1	21	15.0%	12	7.5%	33	11.0%
• 1- <5	42	30.0%	41	25.6%	83	27.7%
• 5-<10	15	10.7%	24	15.0%	39	13.0%
• 10-<15	10	7.1%	2	1.3%	12	4.0%
• ≥15	52	37.1%	81	50.6%	133	44.3%
<b>Work status</b>						
• <36	39	27.9%	27	16.9%	66	22.0%
• 36 – 40	77	55.0%	92	57.5%	169	56.3%
• >40	24	17.1%	41	25.6%	65	21.7%

**Table (2): Staff nurses' perception of work design characteristics**

Items	Medical Units (n=140)	Surgical units (n=160)	Total (n=300)	t	p
	Mean score% ± SD	Mean score% ± SD	Mean score% ± SD		
A) Task characteristics	71.41±12.00	72.46±12.25	71.97±12.12	0.746	0.456
B) Knowledge characteristics	69.87±11.67	72.84±12.69	71.45±12.30	2.104*	0.036*
C) Social characteristics	62.91±13.08	64.50±14.95	63.76±14.11	0.980	0.328
D) Work context	65.97±13.09	65.17±15.14	65.54±14.20	0.495	0.621



<b>Overall Work design</b>	67.54±10.15	68.74±11.64	68.18±10.97	0.955	0.340
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t: Student t-test

\*Significant difference p value ≤ 0.05

**Table (3): Staff nurses' perception of creativity factors**

Items	Medical Units (n=140)	Surgical units (n=160)	Total (n=300)	t	p
	Mean score% ± SD	Mean score% ± SD	Mean score% ± SD		
Originality	77.08±20.71	80.63±19.42	78.97±20.07	1.528	0.128
Fluency	83.69±20.43	83.33±18.79	83.50±19.54	0.158	0.875
Flexibility	84.40±19.71	84.17±20.88	84.28±20.31	0.101	0.920
Elaboration	85.63±16.49	84.69±16.04	85.13±16.23	0.498	0.619
Tolerance of ambiguity	73.21±25.03	78.02±25.59	75.78±25.40	1.640	0.102
Resistance to premature closure	91.34±14.61	88.36±15.30	89.75±15.03	1.719	0.087
Divergent thinking	86.90±19.05	87.60±15.89	87.28±17.41	0.347	0.729
Convergent thinking	87.86±16.47	87.19±16.74	87.50±16.59	0.348	0.728
Risk taking	78.48±18.25	72.81±21.65	75.46±20.30	2.433	0.016
Intrinsic motivation	87.23±18.82	81.17±20.51	84.00±19.94	2.653	0.008
Extrinsic motivation	78.81±28.89	73.12±34.77	75.78±32.23	1.527	0.128
<b>Overall Creativity levels</b>	<b>83.15±12.68</b>	<b>81.92±10.48</b>	<b>82.49±11.56</b>	<b>0.909</b>	<b>0.364</b>

t: Student t-test

\*Significant difference p value ≤ 0.05

**Table (4): Correlation between work design and staff nurses' creativity**

		Work design	Creativity
Work design	r		
	p		
Creativity	r	0.197*	
	p	0.001*	

r ≥ 0.9 very strong correlation  
r < 0.5 weak correlation

r 0.7- < 0.9 strong correlation  
\* Significant p at ≤ 0.05

r 0.5- < 0.7 moderate correlation

**Table (5): Multivariate analysis linear regression show the effect of work design dimensions on creativity**

	B	t	Sig.	95% CI of B	
				LL	UL
A) Task characteristics	0.083	1.100	0.272	-0.066	0.232
B) Knowledge characteristics	-0.081	-1.154	0.249	-0.220	0.057
C) Social characteristics	0.115	1.662	0.098	-0.021	0.250
D) Work context	0.070	1.033	0.302	-0.064	0.204
<b>R<sup>2</sup> = 0.053, F = 4.089*, p = 0.003*</b>					

R<sup>2</sup>: Coefficient of determination  
t: t-test of significance  
CI: Confidence interval

B: Unstandardized Coefficients  
LL: Lower limit  
\*: Statistically significant at p ≤ 0.05

F, p: f and p values for the model  
UL: Upper Limit

**Table (6): Multivariate analysis linear regression shows the effect of overall Work Design on creativity**

	B	t	Sig.	95% CI of B	
				LL	UL
<b>Overall Tool2 WDQ</b>	0.208	3.473*	0.001*	0.090	0.326

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**$R^2 = 0.039$ ,  $F = 12.064^*$ ,  $p = 0.001^*$**

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R<sup>2</sup>: Coefficient of determination  
t: t-test of significance  
CI: Confidence interval

B: Unstandardized Coefficients  
LL: Lower limit  
\*: Statistically significant at  $p \leq 0.05$

F,p: f and p values for the model  
UL: Upper Limit

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