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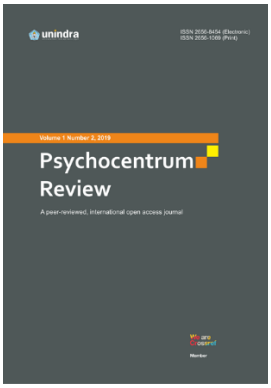

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Development and validation of computer induced distress and factors influencing technostress among ICT users

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Original Article

Development and validation of computer induced distress and factors influencing technostress among ICT users

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Abstract. The increased use of information computer technology (ICT) across the Nigerian workplace have engendered the high incident of Techno stress or Computer Induced Distress (CID) in the work space. However, proper conceptualization and measurement of this phenomenon have not been done in the Nigerian context based on the review literature. This study develops and investigate the incidence of CID, and influence of expertise and education on CID among ICT users in organisations. The study is a cross sectional survey research design. Three hundred and ninty-eighty (398) employees working in ICT related activities were selected from private and public organisations in Lagos metropolis. Results revealed a reliability and validity coefficients (Cronbach alpha. 0.91). Factorial validity yielded three factors; psychological, depression, and physiological strain dimensions. Psychological, depression, and physiological dimensions converged with CID and discriminated by level of computer related skills. CID was associated with use of lower order computers, and non-provision of ergonomic comfortable work station. There was significant effect of level of ICT skills on CID. Provision of conducive and comfortable work environment as preventive measure in reducing technostress was advised.

Keywords: Information and computer technology (ICT); Technostress; Computer Induced Distress (CID); Ergonomically suitable work station; ICT skills.

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Introduction

In the modern work settings, its increasingly becoming important to be knowledgeable about the stressors employees experience when in use of technology in order to have a more satisfying and productive workplace. The information and communication technology (ICT) advancement has not only brought about innovations in the business world, it has well raises concerns involving negative effects on individuals and organisations life. The effects have shown that technology comes with dual outcome; positive and negative, leading to significant benefits on the one hand and its detrimental effects on the other hand. Early studies suggested that operating modern technology in workplace can induce its own kind of stress referred to as technostress (Brivio et al., 2018; Tacy, 2016). For instance, Funminiyi, Akinlolu, and Agboola (2014) observed that users and staff experienced physical and emotional stress in the course of adapting to the increasingly complex technologies in workplace. This has resulted on the increase of psycho-physical workload due to increased work speed, and subsequently resulted in physical

and emotional stress that leads to high employee's absenteeism, turnover as well as increase in litigation costs linked to workplace stress.

Following literature reviewed by Lee, Lee, and Suh (2016) coined technostress as "a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner." On the other hand, Suh and Lee (2017) viewed technostress in another perspective " as a state of arousal observed in certain employees who are heavily dependent on computers in their work." Although other scholars have put forward different definitions of technostress, most of them manifests in two distinct and related ways. First, in the struggle to accept computer technology, and second in the more particular form of over-identification with computer technology. Growing number of studies have made significant contributions identifying different forms of technostress (Hauk, Göritz, & Krumm, 2019; La Torre, Esposito, Sciarra, & Chiappetta, 2019; Lee et al., 2016; Nimrod, 2018; Olasanmi, 2016b; Tarafdar, Cooper, & Stich, 2019). For example, data smog, multitasking madness, computer hassles and burnout were identified as four forms of technostress (Chen, 2015). Data smog is referred to as the information overload experienced by users which could lead to fatigue syndrome. Multitasking madness referred to the conflict between the multitasking nature of computer systems and the limitation of the human mind. Saganuwan (2015) reported that technostress manifested psychologically and behaviourally in ways that include: techno-overload, techno-invasion, techno-complexity, and techno-uncertainty. Saganuwan (2015) describe these technostress dimensions as technostress creators while Marchiori, Mainardes, and Rodrigues (2019) referred to it as stressors. Ragu-Nathan, Tarafdar, Ragu-Nathan, and Tu (2008) developed and validate two constructs related to stress: technostress creators and technostress inhibitors to examined the stress experienced by ICT users. Furthermore, Çoklar, Efilti, and Sahin (2017) developed teachers' techno-stress levels defining scale after observed from literature that techno stress scales developed were context specific (Hudiburg, 1995; Ragu-Nathan et al., 2008; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007). La Torre et al. (2019) emphasized that the two forms of techno stressors go hand-in hand; that both physical and the psychological forms are always present. For example Laspinas (2015) found that physiological stressors i.e back pains, eyes strain, increased heart rate are more prominent compared to the psychological components among ICT users. In another stance most of the scales developed did not address the ergonomic hazards peculiar with techno-stressors.

Most study on techno-stressors reported that there is high level of ergonomic related problems among users (Momodu Bayo, Edosomwan Joseph, & Edosomwan Taiwo, 2014; Olasanmi, 2016a; Omosor, 2014). This study include the measures of ergonomic deficiency and physiological stressors in the current inquiry. This study hence chooses to develop and investigate the incidence of computer induced distress (CID). Specifically, the study develops and validate psychometric characteristics of the computer induced distress scale. Hence the first hypothesis stated that: *Computer Induced distress will demonstrate significant reliable and valid psychometric characteristics*.

Given the current situation, that Nigeria is going through technological revolution in the ICT sector by which ICTs are being continuously updated or introduced, and traditional formats are being replaced or supplemented, little is known about how these changes affect ICT users in the Nigeria workplace (Olasanmi, 2016b). Nevertheless, despite the procedures for the ergonomic work practices and principles for the use of computer technology has received great attention in developed nations, its implication on employee performance, health issues and organisational productivity is still a concern in modern work settings especially in developing nations. The Occupational Safety and Health Academy (2017) describe ergonomics as consists of designing of workstations, work practices and work flow to fit the employee's capabilities. Hadge (2007) noted earlier that to minimize computer users the risk of developing any injury, a good work ergonomic arrangement will allow users to work in comfortable environment. In spite of this observation by past empirical studies, it is still a concern to researchers (Ismaila, 2010; Oladeinde, Ekejindu, Omoregie, & Aguh, 2015) in the growing field of ergonomic on the

increase in work-related health problem among the ICT users especially in developing nations. Some studies in Nigeria (Funminiyi et al., 2014; Momodu Bayo et al., 2014; Olabode, Adesanya, & Bakare, 2017) have identified that the positioning and posture of computer users resulted in musculoskeletal disorders due to poor workstations design or inappropriate work environment. For instance, Johnson, Onigbinde, Onasanya, Emechete, and Gbela (2009) observed in Nigeria University community, that common complaint among computer users is back pain, neck, eyes and wrist pain. Also, Jomoah (2014) found that computer users' complaints increase with the decrease in workstation ergonomic score, progress of age and duration of employment. Past empirical findings have reported the effect of age on technostress. Some researchers found that older employees experience less technostress than younger employees (Jena & Mahanti, 2014; Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2011) possibly because of longer organisational tenure. They explained that it may be because of specific experience and better knowledge of how to embrace the stress creating effects of ICT in their work context. While others believe that younger people experience less technostress because they are more familiar with latest technology (Çoklar & Sahin, 2011; Mahalakshmi & AllySornam, 2013). The age related association with techno stress in Nigerian context have not been fully explored. The present study thus further contribute to literature on ergonomic hazards, age of respondents and computer induced distress. Hence the second hypothesis that stated: *"provision of ergonomic suitable facilities; age and work duration will be significant correlates of computer induced distress."*

In addition, there is little information regarding the level of expertise that mitigates the impact of technostress or distress among ICT professionals in the country. Moreover, very few studies, for example Jena and Mahanti (2014) also found that academicians who have more formal Information Technology (IT) education experienced less technostress than those with little formal IT education. On the other hand, Jena and Mahanti (2014) observed that academicians who have technical (IT) education and stay longer time on computer experienced less technostress, as they would be more familiar with respects to IT changes and upgrades. Thus, the study investigates the influence of ICT skills on computer induced distress among ICT users in organisations. And lastly, it assesses whether ICT users with no formal ICT training have more computer induced distress than ICT users with formal ICT training.Hence the third and fourth hypotheses that stated: *"level of ICT skills will not have significant influence computer induced distress", "ICT users with no formal ICT training will significant report more computer induced distress than ICT users with formal ICT training."*

Method

The study is a cross sectional survey research design in which no manipulation of the independent variables was done. The independent variables are ICT Knowledge, expertise and provision of ergonomically suitable work station for ICT users. While the dependent variable is computer induced distress.

Participants

Three hundred and ninty-eight employees (398)mworking in ICT related activities were selected from both public and private organisations from Lagos State, Nigeria. The average age of the participant was 39.68 (S.D= 11.49) years. Males were 56% and females were 44%. Marital status reveals that 68.7% were married, 1.7% widowed, 4.3% were separated and 25.5% were singles. Participants education qualification shows that 53.3% had Higher National Diploma certificate, 31.7% had first degree certificate, 3.3% had Master's degree certificate, 10.3% had Ordinary National Diploma certificate and 1.3% had Secondary School Certificate. Also, 78.7% of the participants did not have ICT education compare to 21.3% who have ICT

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related education. 76.3% were normal users, 10% were beginners, 12.7% were professionals and 1% were programmers. Only 30% have a computer work station and 70% did not have. The average years of experience is 7.7years.

Sampling Procedures

Mulstage sampling technic was used to select the participants. First the authors select Twenty ICT related organisations listed the Stock exchange and 5 public organisations (2 Federal and 3 State) located in Lagos City, the commercial capital of Nigeria. In the selected organisations using stratified sampling technique was used to sample 20 employees in the upper, middle and lower management involved in ICT related job activities. However, the authors were able to retreived only 415 copies. From the copies only 398 were useable.

Materials and Apparatus

A structured questionnaire, made up of two sections with all sections written in English. The socio-demographic captured include age, gender, education, ICT education, expertise, type of computer, duration of work hours and subsection measuring the provision of ergonomically comfortable work station. Type of computer was measured based on sophistication of machine use from desktop, laptop to hyped and tablet or combinations of these categories. Expertise was measured at four levels; Beginners, normal user, professional and programmer. ICT education was measured with bivariate response; Yes, or No. The provision of ergonomically comfortable work station was measured by asking the level of ergonomically suitability of furniture, ventilation, Hands free and Wi-Fi connections provided if any using the response format "Not Available, Available but not comfortable to the computer users and Available and comfortable to the computer users." Computer induced distress was measured using 12 items scale developed by the researcher. The scale was aimed at measuring the respondent's experience of anxiety, depression, addiction or distress felt as a result of the using ICT related equipment. Personal and work situations using a computer or ICT related equipment in the last one year was assessed and evaluated according to its extent of annoyance, provocation of feeling on a 0 – 4 scale; 0 = this is not applicable to me; 1 = i don't experienced this at all; 2 = i experienced this some times ; 3 = I experienced this frequently ; 4 = I experience this most of the time. The scale achieved a reliability of 0.91 Cronbach alpha and meritorious validity coefficients.

Scale Development

The first phase involved item generation. Items were generated from existing scales (Çoklar et al., 2017; Nimrod, 2018; Ragu-Nathan et al., 2008; Tarafdar et al., 2007) and literature review of techno stress (Funminiyi et al., 2014; Marchiori et al., 2019; Saganuwan, 2015). An initial pool of 45 items generated was given to 3 psychologists in the Department of Psychology, University of Ibadan for expert judgment on the suitability of the items. Information relevant to the construct definition of Computer induced distress was given to the expert judges to use in ascertaining whether the items were germane to the study and properly phrased. Nunnally (1978) considered this procedure an acceptable method for determining content validity. An item was retained if 2 out of the 3 experts approximately (66.6%) considered it useful. The procedure led to the reduction of the items from 45 to 38. The 38 items were scored on a Likert format and pre-tested in a pilot study where 50 employees from two organisations (one private, one public). The reliability was 0.72 as 4 items were deleted for low Total item correlation value. In the Second phase, the remaining 34 items were refined and reordered was administered to the a larger employees to determine the psychometric properties of the scale and establish its validity.

Procedures

The item refinement was carried out through literature review and adaption of items from from earler studies. Face validity was establised by three subject experts in organisational behaviour and items were pilot tested among 50 employees in two organisations different from the organisations used in the main study. In the main study, a total of 500 copies of questionnaire were distributed. Permission was sought from the managers of the various organisations to carry out the study. After the permission was granted, the stratified sampling technique was used to sample the respondents at their various duty posts. The purpose of the study was strictly explained to the respondents. They were assured that the information would be treated confidentially. Informed consent was obtained from the respondents before the administration of questionnaires. The researchers were able to recover 398 copies from the respondents, a 76.9% response rate. Properly filled questionnaires were used in the analysis.

Data Analysis

The data collected was analysed using the Statistical Package for Social Sciences (SPSS) software. Item analyses was done using inferential statistics such as exploratory factors analysis including Principal Component Analysis with varimax rotation. Pearson correlation, t-test for independence and ANOVA were used to test the mean differences based socio-demographic characteristics at 0.05 level of significance.

Results

Hypothesis I

The first hypothesis stated that: Computer Induced distress will demonstrate significant reliable and valid psychometric characteristics. The hypothesis was tested using Principal Component Analysis with varimax rotation, and Cronbach alpha and split half reliability. The result presented in Table 1.

Reliability

Table 1: Item reliability statistics showing Item-Total Statistics and Cronbach alpha reliability

Reliability Statistics			Item-Total Statistics			
Cronbach's Alpha	N of Items		Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
.909	12					
1.	Having issues with my computer/laptop makes me been so anxious that I couldn't make up my mind about the simplest thing.		18.9700	133.247	.679	.900
2.	Muscle soreness and muscle fatigue are the most common complaints I experience as a regular computer users.		18.7933	134.526	.586	.905
3.	Having issues with my computer/laptop makes me been depressed without knowing why.		18.9333	133.146	.606	.904
4.	Recently, after having problems with the computer/laptop I was so low in spirits that I sat for hours doing absolutely nothing.		18.4800	132.050	.665	.901
5.	Errros and malfunctioning computer/laptop makes me irritable and tensed because it increases my workload and affect my schedule		18.9367	133.023	.722	.899
6.	I become restless or irritable when I when I am required to reduce my time the computer or online		18.6300	134.635	.660	.901

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7.	I feel numbness in arms during and after working on the computer/online	19.0567	137.010	.621	.903
8.	Over time, I have had to spend more time on the computer such that it is affecting my family and relationship with others	18.4867	133.796	.657	.901
9.	Sometimes if my computer/laptop cannot boot or work properly makes me been so angry, uncomfortable and dejected	18.6833	134.565	.705	.900
10.	I have made unsuccessful attempts to reduce or control my use of the Internet.	18.8700	132.107	.706	.899
11.	I usually experience chest pain during and after working on the computer/online	18.8267	134.572	.561	.906
12.	I have to sit in uncomfortable posture while using the computer	18.7233	134.448	.573	.906

Source: Authors computation (2019)

The reliability was derived from the Cronbach alpha analysis. The initial reliability was 0.71 of which 22 items were found to have poor reliability based on low Total item correlation of 0.4 standard set by scholars (Nunnally, 1978). After deletion of items the reliability rose to 0.91cronbach alpha.Split half reliability spearman brown co-efficient was 0.89 and Guttmann split half reliability of 0.89. Alpha for the split items (Part 1= 0.84 and Part 2 = 0.83) were reliable. The correlation between forms of 0.82 suggesting a good internal homogeneity.

Factorial Validity

The scale was analysed using exploratory factor analysis using the principal factor analysis, using varimax rotation to address the dimensionality of the scale. The Bartlett test and Measure of Sampling Adequacy (MSA) and Bartlett test of Sphericity tests if the correlation matrix correlations can be factorized.

Table 2: Factors analysis loadings showing factors on different dimensions of Computer Induced Distress based using Varimax Rotated Component Matrix.

		Components		
		Psychological Strain	**Lethargy**	**Physiological Strain**
	Alpha	.87	.82	.785
1.	I have made unsuccessful attempts to reduce or control my use of the Internet.	.877		
2.	Errros and malfunctioning computer/laptop makes me irritable and tensed because it increases my workload and affect my schedule	.839		
3.	Having issues with my computer/laptop makes me been so anxious that I couldn't make up my mind about the simplest thing.	.830		
4.	Sometimes if my computer/laptop cannot boot or work properly makes me been so angry, uncomfortable and dejected	.705		
5.	I become restless or irritable when I am required to reduce the time I spent using computer or online	.691		
6.	Over time, I have had to spend more time on the computer such that it is affecting my family and relationship with others	.556		
7.	Having issues with my computer/laptop makes me been depressed without knowing why.		.882	
8.	I feel numbness in arms during and after working on the computer/online		.835	
9.	Recently, after having problems with the computer/laptop I was so low in spirits that I sat for hours doing absolutely nothing.		.601	
10.	I usually experience chest pain during and after working on the computer/online			.865
11.	I have to sit in uncomfortable posture while using the computer			.755
12.	Muscle soreness and muscle fatigue are the most common complaints I experience as a regular computer user.			.674

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Source: Authors computation (2019)

PCA has shown that all constructs have been extracted to three respected factors of EFA with the cut point of Eigen value 1 and Kaiser-Meyer measure of MSA was 0.789 showing a good sampling adequacy (KMO = .789, $\chi^2(66)$ = 2511.17, p<.001). A three-factor structure explaining 71.87% of the variance was produced. The factor loading for the items ranged from 0.877 to .55, which indicated that all the items loaded well on the factors precipitated. The factors precipitated include psychological strain, depression and physiological strain dimensions.

Convergent Validity

Table 3: Pearson Product Moment correlation showing the relationship between dimensions of Computer Induced Distress (CID)

		Mean	S.D	Norm [1 S.D +Mean]	α	1	2	3
1.	Computer induced distress	20.49	12.57	33.06	.91	.890**	.873**	.783**
2.	Psychological Strain	8.36	5.93	14.29	.87	-	.659**	.528**
3.	Depression	7.00	4.79	11.80	.82		-	.571**
4.	Physiological Strain	5.13	3.97	9.10	.79			-

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Authors computation (2019)

The person correlation analysis revealed that there was significant positive relationship between dimensionality of Computer Induced distress. Computer induced distress was strongly associated with psychological strain, depression, and physiological strain dimensions. This provides evidence that all three dimensions are related to the same construct was supported.

Concurrent Validity

In concurrent validity, it the operationalization's ability to distinguish between groups was assessed. The concurrent validity of the new measure of computer induced distress (CID), the measure was given to both skilled users and non-skilled users.

Table 4: showing the means and standard deviation scores of the ICT users based on and Computer induced distress.

Computer. Skill		Computer induced Distress	Techno Psychological Strain	Techno. Depression	Techno Physiological Strain
Beginner	Mean	28.13	11.43	9.60	7.10
	S.D	7.57	4.26	3.29	2.71
Intermediate	Mean	19.92	8.07	6.74	5.10
	S.D	13.13	6.19	4.84	4.14
Professional	Mean	17.75	8.46	5.71	3.59
	S.D	8.71	5.46	3.14	2.69
Total	Mean	20.49	8.36	7.00	5.13
	S.D	12.57	5.93	4.79	3.97
	F-ratio	4.506	3.176	3.533	4.121
	Sig.	.004	.024	.015	.007
	η^2	.044	.031	.035	.040

Source: Authors computation (2019)

The result in Table 4 shows that computer induced distress was influenced by the level of computer related skills of ICT users. Beginners reported more computer induced distress than professionals and Intermediate skilled. Computer induced distress is concurrent lowered as the users' skills improves.

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Hypothesis II

The second hypothesis stated that provision of ergonomic suitable facilities, age and work duration will be significant correlates of computer induced distress was tested using Pearson Product Moment Correlation (PPMC) and the result presented in Table 5.

Table 5: Pearson Product Moment Correlation (PPMC) of Computer induced distress, age and contextual variables of ICT professionals.

	M	S.D	1	2	3	4	5	6
1. Computer induced distress	20.49	12.57	-	.001	-.013	-.045	-.123*	.137*
2. Age	39.68	11.49		-	.121*	.096	.023	.153**
3. Daily work houratwork	4.67	2.09			-	.142*	.065	.252**
4. Daily work hourathome	.67	.91				-	.157**	.418**
5. Type of computer	5.02	10.95					-	.266**
6. Ergonomic work context	9.40	3.85						-

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Authors computation (2019)

Table 5, shows that Computer induced distress was associated with use of lower order computers (r = 0.12, p<.05), and level of ergonomic comfort (r = 0.14, p<.05). However, the relationship between age, work hour at the office and at home were non-significant. The hypothesis is thus partially accepted.

Hypothesis III

Hypothesis three stated that level of ICT skills will not have significant influence computer induced distress was analysed using one-way ANOVA and the summary of the result presented in Table 6.

Table 6: Descriptive statistics and LSD multiple comparison analysis showing the mean differences in Computer induced distress based on level of ICT skills

				LSD POST HOC ANALYSIS		
Level of ICT skills	N	$\bar{x}$	S.D	1	2	3
Beginners	90	28.1333	7.56914	-		
Intermediate	247	19.9170	13.12748	8.21*	-	
Professionals	61	17.7456	10.59966	9.97*	1.76	-
Total	398	20.4900	12.57313			

*. The mean difference is significant at the 0.05 level.
Source: Authors computation (2019)

The result of anlysis of variance significant reveals a significant effect of level of ICT skills on computer induced distress (F (2,396) = 4.51, p<.001). ICT users who were professionals ($\bar{x}$ = 18.15) and programmers ($\bar{x}$ = 17.33) significantly reported lower computer induced distress than those with lower ICT skills. Also, ICT users who were intermediate skilled reported lower computer induced distress than ICT users who were beginners. The result demonstrates that computer induced distress decreased with increasing level of ICT skills. The null hypothesis is thus rejected and the alternate hypothesis accepted.

Hypothesis IV

Hypothesis four stated that this hypothesis was analysed using the t-test for independence and the result presented in Table 7.

Table 7: t-test summary table showing the influence of ICT users' Training on Computer induced distress.

	ICT training	N	Mean	S.D	*df*	*t*	Sig.
Computer induced distress	Yes	102	18.6875	11.11823	396	-1.29	>0.05
	No	296	20.9788	12.91789			

Source: Authors computation (2019)

The result from Table 7, shows that ICT users with no formal ICT training (M=18.68, S.D = 11.11) reported lower averaged scores on computer induced distress scale compare to ICT users with no formal ICT training (M=20.97, S.D =12.91). Formal ICT training did not significantly influence computer induced distress (t (396) = -1.29, p>.05). This implies that formal ICT training did not affect the level of computer induced distress among the ICT users sampled. The hypothesis is thus rejected.

Discussion

This study examined computer induced distress among ICT users who are employees of organisations. The computer induced distress scale demonstrated significant and meritorious reliability was confirmed. The results revealed that the reliability indices was meritorious. Fctorial validity revealed a multi-dimensional scale and a positive internal convergency. In concurrent validity, computer induced distress discriminated among skills of ICT users. Computer induced distress is concurrent lowered as the users' skills improve. The findings are in line with previous studies that have identified different dimensions to the measurement of technostress (Ragu-Nathan et al., 2008; Rosen, 2010; Tarafdar et al., 2019; Tarafdar et al., 2007; Tarafdar, Tu, & Ragu-Nathan, 2010; Tarafdar et al., 2011). The second hypothesis which stated that provision of ergonomic suitable facilities; age and work duration will be significant correlates of computer induced distress was partially confirmed. The finding shows that computer induced distress was associated with use of lower order computers and non- provision of ergonomic comfortable computer work station. However, the relationship between computer induced distress and age, work hour at the office and at home were non-significant. This implies that age is not a significant factor in ICT user's technostress. The present findings are in agreement with related empirical findings. For example, the present finding on non-provision of ergonomics comfortable computer workstation is in consonance with the findings of Asaolu and Itsekor (2014), (Momodu Bayo et al., 2014), (Jomoah, 2014) who found that the incidences of general complaints of computer users surround the poor or decrease in work station ergonomics provisions. In Nigeria, this can be in connection with recent findings by Olabode et al. (2017) that several factors such as awareness, resources constraints, communication and integration disconnection between employees and equipment designers, technological changes and insufficient relevant studies inhibited the efficient implementations in Nigeria. On the other hand, in respect of the effect of age on computer induced distress, the present finding is in contrary to some recent finding by Jena and Mahanti (2014), and Mahalakshmi and AllySornam (2013) who reported significant effect of age on technostress.

The third hypothesis which stated that the level of ICT skills will not have significant influence on computer induced distress was rejected while the alternate hypothesis accepted. The finding shows a significant effect of level of ICT skills on computer induced distress, and

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that computer induced distress decreased with increasing level of user's ICT skills. The post hoc analysis further show that ICT users who were professionals or intermediate skilled reported lower computer induced distress than those with lower ICT skills. The finding is in consonance with similar findings from the past studies, which have demonstrated that both IT professionals and end-users experienced technostress (Shepherd, 2004).

The fourth hypothesis which stated that ICT users with no formal ICT training will significantly report more computer induced distress than ICT users with formal ICT training was rejected. Formal ICT training did not affect the level of computer induced distress among the ICT users sampled. This is in contrast to the findings from Tu, Wang, and Shu (2005) who demonstrated that individuals with high computer literacy suffered low techno-stress, while individuals with low computer literacy suffer greater techno stress in their research. Similarly, Jena and Mahanti (2014) demonstrated that academicians having with formal IT education are more exposed to technology and so experienced less technostress than academicians having less formal IT education.

Conclusion

Based on the key findings from this study, it can be concluded that the reliability derived from the Cronbach alpha and validation analysis were meritorious and multi-factorial. Computer induced distress was concurrently lowered as the user's skills improve. Computer induced distress was associated with use of lower order computers and non- provision of ergonomic comfortable computer work station. Computer induced distress decreased with increasing level of ICT skills. Formal ICT training did not affect the level of computer induced distress among the ICT users sampled. On practical implications, the computer induce distress instrument developed and validated in the present study will help human resource practitioners first to identify different potential technology related sources of negative stress among ICT user's in their organisation. Organisation management can put up measures such as provision of healthy and conducive work environment as well as good and considerate working conditions to prevent or limit the lethargy, psychological and physiological strain linked to user's technostress. Also, organisations management can make provision for mechanisms such as end-user training and user's decision participation.

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