Workplace psychological violence among junior physicians employed in an Egyptian University Hospital

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Abstract

Workplace psychological violence (WPPV) is anorganizational behavior problem. Study objectives were to determine the structure of WPPV, assess its prevalence, and identify high-risk categories among junior physicians in surgical and medical departments in an Egyptian university hospital. A self-administered questionnaire incorporating 45-item Leymann Inventory of Psychological Terror was used as an initial item pool to collect data. Exploratory factor analysis was used to identify a two-factor measurement model and confirmatory factor analysis – via structural equation modeling- was applied to assess its construct validity.Factorial validity was established thru global and local fit diagnostics. Convergent validity was demonstrated via adequate subscales alpha coefficients, composite reliabilities, variances extracted, and weight and significance of item loadings. Discriminant validity was verified by moderate interfactor correlations and subscales composite reliabilities were greater than average variance extracted. The validated model was used to determine the prevalence of WPPV, which provedto be(36.7 %).WPPV was more prevalent in surgical than medical departments. Females were less exposed to WPPV than males. Physicians with "very good" merit at M.B.Ch.B. were more exposed to WPPV than those with an "excellent" merit. Interventions and preventions in the form of policy, regulations, guidelines, and educational programs were recommended.

Keywords: Workplace Psychological Violence, Factor Analysis, Structural Equation Modeling, Psychometric Properties, Junior Physicians.

Introduction

Workplace psychological violence (WPPV) is a globally widespread abusive organizational behavior activity (Salin, 2008). The terms WPPV, bullying, mobbing, mistreatment, harassment, intimidation, incivility and victimization are used interchangeably (Brodsky, 1976; Cortina& Magley,2003,Godin, 2004;Josipovic-Jelic, Stoini, &Celic-Bunikic, 2005;Leymann, 1990; Moreno , Beltrán, Tsuno, Inoue, &Kawakami, 2013; Shahin, Cetin, Cimen, &Yildiran, 2012; Taspinar et al.,2013; Twale& Luca, 2008;Westhues, 2002; Yurdakul et al., 2011). WPPV can be defined as frequent negative behaviors directed at an employee that create the risk of harming the victim personally and professionally (Chiril & Constantin, 2013). WPPV could be experienced in the form of microaggressions such as being talked to in an angry tone of voice, being given a filthy look, eye rolling, threatening, frightening, arrogances, ignoring behaviors, exclusion from conversations, destabilization, assignment of offending tasks, social isolation and various forms of other unethical acts that undermines victim’s rights, dignity, self-expression, social life, personality, personal reputation, work performance, professional credibility, and psychological and social integrity (Glomb, 2002; Godin, 2004; Hutchinson, Vickers, Jackson, & Wilkes, 2006; Taspinar et al., 2013; Yıldırım &Yıldırım, 2010; Zapf, 1999).

In Europe it was found that 3.6-16% of the workforce has been exposed weekly or more to some form of WPPV (Agervold, 2007;Einarsen&Rakens, 1997).In various parts of the world, healthcare workers, especially in hospitals, are confronting alarmingly increasing rates of WPPV (di Martino, 2003).More than half of the health personnel in different countries have experienced some sort of WPPV during their work-life (WHO, 2002a).In the U.K., a National Health System (NHS) study reported that one of three staff has been exposed to WPPV (Quine,1999).

Physicians working in bureaucratic academic university affiliated governmental hospitals are especially susceptible to WPPV (Björkqvist, Österman, &Hjelt-Back, 1994; Daugherty, Baldwin, & Rowley, 1998; Keim& McDermott, 2010; Kivimäki, Elovainio, &Vahtera, 2000;McKay, Arnold,Fratzl, & Thomas, 2008; Quine, 2002; Raskauskas, 2006; Twale& Luca, 2008).In university hospitals junior physicians positioned at relatively lower organizational tiers are less protected and more exposed to victimization(Baldwin et al., 1998; Björkqvist et al., 1994; Daugherty et al.,1998; Korukcu, Bulut, Tuzcu, Shahin, &Türkmen, 2014; Quine, 2002; Taspinar et al., 2013).A survey conducted by the Workplace Bullying Institute (WBI) indicated that 72% of workplace bullying incidences involved a victim that was ranked lower than the harasser (WBI, 2012).In the U.K., it has been shown that 37% of junior physicians had been exposed to WPPV and 84% had experienced at least one bullying behavior (Neuman& Baron, 2003; Quine, 2002).In Turkey a study found that 87.7% of junior male physicians had a bullying experience in the year preceding the study (Shahin et al., 2012).

Regarding its serious consequences on employees and organizational wellbeing, there are earnest concerns towards preventing and controlling WPPV it(Kaufer, Mattman, 2012; Snyder et al.,2015).Nonetheless,WPPV is a context-related phenomenon; and the way it is enacted, its theoretical structure and prevalence have to be specifically delineated for a particular setting (Cortina, &Magley, 2003 ;Crawshaw, 2009; Zapf &Einarsen, 2001).The structure of WPPV designates distinctive patterns of negative acts reflecting their associated latentfactors (Einarsen, Hoel, Notelaers, 2009;Einarsen, &Skogstad, 1996).A number of studies in different countries have aimed to identify particular risk groups of workplace bullying and included demographic factors, such as sex, age, and organizational position, however, results are often contradictory and ambiguous (Salin, & Hoel, 2013).

The present study objectives are to determine the theoretical structure of WPPV, assess its prevalence, and identify high-risk categories among junior physicians in surgical and medical departments in AMUH, Egypt.It is conjectured that WPPV is a multidimensional rather than a unidimensional construct that happens to a certain measure in the study setting.In addition, it is hypothesized that(i) junior physicians working in surgical the department are more exposed to WPPV than their counterparts in the medical department; (ii) female physicians are more exposed to WPPV than their male colleagues;and (iii) physicians with a “very good” M.B.Ch.B. merit are more exposed to WPPV than those with an “excellent” merit.

Material and Methods

An observational cross-sectional study was conducted at surgical and medical departments in AMUH, Egypt, in the period from 14/8/2016 till 29/9/2016. The study population consisted of junior physicians who worked at the study setting for at least one year. Junior physicians weredefined as resident physicians whose period of service did not exceed five years. Junior physicians whose period of service was less than one year were not included in the study. Permission was obtained from authorities of AMUH before conducting the study that was approved by the Ethical Committee in Alexandria Main University Hospital on 7/8/2016. The purpose of the study was explained, participation was voluntary and all participants gave verbal informed consent and were assured aboutthe anonymity and confidentiality of the questionnaire. The researcher complied with the International Committee of Medical Journal Editors (ICMJE) recommendations and declares no conflict of interest. A specifically designed self-administered questionnaire was delivered, in English, to all junior physicians who were working at the study setting for at least one year; their number totaled to sixty-six. Six physicians did not respond, yielding a 90.91 % response rate.

The questionnaire contained three sections:

The first section served to introduce the researcher to the participants and inform them that the main purpose of the questionnaire is to elicit their responses about the frequency of their being exposed to various types of negative acts from their coworkers in their workplace during the preceding year. The second section encompassed items of personal data pertaining to participant's age, department, gender, marital status, duration of service in the study setting and his/her attained M.B.Ch.B. merit. The third section is designed to collect data about the frequency of occurrence of forty-five bullying acts comprising Leymann Inventory of Psychological Terror (LIPT) (Anti-Mobbing, 2016).LIPT was used as an initial item pool because of its demonstrated internal consistency reliability (Shahin et al., 2012; Zachariadou, Zannetos, Chira, Gregoriou, & Pavlakis, 2017), test-retest reliability (Zachariadou et al., 2017),content validity (Leymann, 1996; Leymann & Gustafsson 1996),and construct validity where two to eight factor solutions have been proposed depending on the distinctive study setting (Aksu, &Akyol, 2011; Chiril & Constantin, 2013; Jeniffer, Cowie, &Ananiadou, 2003; Korukcu et al., 2014; Rogelberg, 2007).

The forty-five negative acts (observed variables/items) of the LIPT are given with their initial codes used in this study:**{**A1}Your superior restricts the opportunity for you to express yourself;{A2}You are constantly interrupted;{A3}Colleagues restrict your opportunity to express yourself;{A4}You are yelled at and loudly scolded;{A5}Your work is constantly criticized; {A6}There is constant criticism about your personal life;{A7}You are terrorized on the telephone; {A8}Oral threats are made;{A9} Written threats are sent;{A10}Contact is denied through looks or gestures; {A11}Contact is denied through innuendo;{A12}People do not speak with you anymore; {A13}You cannot talk to anyone; access to others is denied; {A14}You are relocated to another room far away from colleagues;{A15}Colleagues are forbidden to talk with you;{A16}You are treated as if you are invisible; {A17}People talk badly about you behind your back; {A18} Unfounded rumors about you are circulated; {A19}You are ridiculed;{A20}You are treated as if you are mentally ill;{A21}You are forced to undergo a psychiatric evaluation;{A22}Your handicap is ridiculed;{A23}People imitate your gestures, walk, or voice to ridicule you;{A24}Your political or religious beliefs are ridiculed;{A25}Your private life is ridiculed;{A26}Your nationality is ridiculed;{A27}You are forced to do a job that affects your self-esteem;{A28}Your efforts are judged in a wrong and demeaning way;{A29}Your decisions are always questioned;{A30}You are called by demeaning names;{A31} Sexual innuendoes are present;{A32}There are no special tasks for you;{A33}Supervisors take away assignments so that you cannot invent new tasks to do; {A34}You are given meaningless jobs to carry out;{A35}You are given jobs that are below your qualifications;{A36}You are continually given new tasks; {A37} You are given tasks that affect your self-esteem;{A38}You are given tasks that are way beyond your qualifications in order to discredit you;{A39}You are forced to do a physically strenuous job;{A40}Threats of physical violence are made;{A41}Light violence is used to threaten you;{A42}Physical abuse is present;{A43}Causing general damages that create financial costs to you;{A44}Damaging your workplace or home; {A45}Outright sexual harassment is present. Each item of the inventory was anchored on a five-point Likert scale ranging from "Never" to" Always". The categories of the scale were defined and scored as follows: "Never" is defined as the bullying act not at all occurring to the respondent during the preceding year. Responses in this category are assigned a score of [0]. "Very rare" category is defined as the bullying act occurring to the respondent at most once per month during the preceding year, and responses belonging to this category are assigned a score of [1]. "Sometimes" category is defined as the negative act occurring to the respondent twice monthly during the preceding year, and such responses are assigned a score of [2]. "Usually" category is defined as the negative act occurring to the respondent three times monthly during the preceding year, and such responses are assigned a score of [3]. "Always" category is defined as the negative act occurring to the respondent at least four times monthly during the preceding year, and responses belonging to this category are assigned a score of [4]. On this basis the level of measurement is considered as an interval scale suitable for correlational analyses.

Items whose attained mean item score was less than 1.5 were regarded as non-prevalent in the study setting and were excluded from further analysis. Retained items would be accorded final codes with the prefix (M) and would be subjected to preliminary screening,internal consistency and sampling adequacy analysisto determine their suitability for conducting factor analytic procedures entailedto recognize and confirm the underlying latent factorial structure.

Construct validity of the measurement model was assessed using eight fit indices meant to assess overall model fit, namely:-χ^2 ($p > .05$), normed fit index (χ^2/df) < 2, Standardized Root Mean Square Residual (SRMR< .8), Comparative Fit Index (CFI> .9), Tucker-Lewis index (TLI> .9), Incremental Fit Index (IFI> .9), Root Mean Square Error of Approximation (RMSEA< .1) with 90 % confidence interval (C.I.(lower bound < .05 and upper bound < .10, *p-close*(i.e. p of close fit)> .05. Factor loadings, residual and modification indices (MI)analyses were conducted to ascertain proper model fit on the level of individualized elements. Cronbach's alpha and Raykov's rho coefficients > .8 were respectively used to weigh up the internal consistency and construct (composite) reliabilities of the measurement model. Together with the just mentioned reliabilities, standardized factor loadings > .4 were considered as an evidence of convergent validity.

Interfactor correlation less than .85 was considered as an evidence of discriminant validity. Discriminant validity was further supported by collapsing the factorial structure of the model and running CFA in an explanatory manner to test the fit of the collapsed model. The congeneric model was tested for tau-equivalence and parallelism. Tau-equivalent and parallel models assume independent error terms and are fitted to a covariance matrix.

The validated measurement model was used to determine prevalence of WPPV in the study setting. Total case WPPV score was calculated as the sum of scores of all indicators in the validated measurement model. Average case WPPV score was calculated by dividing total case WPPV score by the number of indicators in the measurement model. Cases with an average

WPPV score of ≤ 2 were reckoned unexposed to WPPV; cases with an average WPPV case score of > 2 to 3 were considered exposed to a mild degree of WPPV; cases with an average total case score of > 3 to 3.5 were regarded exposed to a moderate degree of WPPV; and cases with an average total case score > 3.5 were contemplated exposed to a severe degree of WPPV. Additionally, the validated measurement model was used to determine the exposure to each dimension of WPPV. Total case dimension score was calculated as the sum of scores of the items reflecting the dimension. Average case dimension score was calculated by dividing total case dimension score by the number of indictors specified to each dimension. Cases with an average case score of ≤ 2 were reckoned unexposed to the pertinent bullying dimension; cases with an average case score of > 2 to 3 were considered exposed to a mild degree; cases with an average total case score of > 3 to 3.5 were regarded to be exposed to a moderate degree; and cases with an average total case score > 3.5 were contemplated exposed to a severe degree of bullying on the respective dimension. Student's t-test was used to test the statistical significance of the hypothesized differentialWPPV exposure levels among assorted categories of resident physicians, namely, surgical vs. medical; male vs. female; and "excellent" vs. "very good" M.B. Ch.B. merit residents.

Data analysis was conducted using Statistical Package of Social Sciences- Version 25 (SPSS.25). Structural equation modeling (SEM)was conducted using the Analysis of Moment Structures-Version 24(AMOS.24). Parallel Analysis (PA) was conducted using Parallel Analysis Calculatordevised by Department of Obstetrics and Gynecology affiliated to the Chinese University of Hong Kong & New Territories East Cluster. Available at:http://www.obg.cuhk.edu.hk/ResearchSupport/StatTools/ParallelAnalysis_Exp.php

Results

There was no missing data and the final number of cases utilized in the analyses wasequal to the number of respondents (N = 60). Forty-one participants (68.3 %) were males whereas nineteen (31.7 %) were females. Fifty-one participants (85%) belonged to the age group of 25-28 years, and the remaining nine participants (15%) belonged to age group > 28-30. Maximum and minimum ages were 30 and 25 years respectively, with a mean and standard deviation of 26.87 ± 1.35. Thirty-three participants (55%) worked in the surgical department while twenty-seven (45%) worked in internal medicine department. Maximum and minimum duration of work were 60 and 12months respectively, with a mean and standard deviation of 27.78 ± 14.79. Forty-three residents (71.7 %) got an excellent merit (i.e. from 100% to 85% of the total M.B.Ch.B. grade), while seventeen (28.3 %) got a very good merit (i.e. from < 85% to > 75% of the total M.B.Ch.B. grade). Fifty participants (83.3 %) were single while ten (16.7 %) were married.

Scrutinizing mean item score for each of the forty-five observed variables revealed that thirty-three manifest variables each had a mean score less than 1.5and were deemed non-prevalent in the study setting and excluded from the measurement model. The excluded thirty-three items were(A3, A4, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A30, A31, A32, A33, A40, A41, A42, A43, A44, and A45). The retained twelve items were(A1, A2, A5, A27, A28, A29, A34, A35, A36, A37, A38, and A39)and were respectively accorded their final codes (M1, M2, M3, M4, M5, M6, M7, M8, M9, and M10 and were considered for factor analytic procedures.

For a twelve item dataset, a participant to items ratio of 60 to 12 (i.e. 5:1) is regarded acceptable and the retained twelve items were subjected to preliminary analysis to determine their suitability for factor analysis (FA). There were no univariate outliers since the maximum score for any item was four and the minimum was zero. Histograms, stem-and-leaf diagrams and box-plots exhibited symmetrical distribution with no pictorial sign of univariate non-normality of the twelve indicators. The conclusion of univariate normality was reinforced by the findings that(i) skewness indices of the twelve items ranged between [|.022- 0.729|], (ii) kurtosis indices of twelve items ranged between [|0.341- 1.394|], (iii) critical ratios of skewness ranged between [|0.069-2.305|] and (iv) critical ratios of kurtosis were in the range |.538- 2.293|. All items' skewness and kurtosis were below skewness and kurtosis |2|,indicating univariate normality of the data (Kline, 2016).All items' skewness and kurtosis critical ratios were < |2.58|passing asignal that they were statistically insignificantly different from zero at .01 level of significance (Hair, Black, Babin, Anderson, & Tatham, 2006).Besides the assumption of univariate normality, the bivariate linearity assumption was substantiated as bivariate scatter plots among twelve manifest indicators disclosed lineary uniform relations. A multivariate kurtosis index (Mardia's index) of 13.033 and a kurtosis critical ratio (Mardia's standardized coefficient) of 2.755 (i.e. < 3) ensures multivariate normality of the data (Tabachnick, & Fidell, 2007). The highest Mahalanobis distance for a case was (30.348), a value that is less than the critical $\chi 2$ value ($\chi 2$=32.91; df =12, $p<0.001$), signposting no multivariate outliers (Tabachnick & Fidell, 2007).

The 12-item model professed commendable internal consistency reliability thru Cronbach's Alpha (α) and Guttman's split-half coefficients of (0.903) and of (0.818) respectively and both exceeded an endorsed (.8) threshold (Norusis, 2000). The factorability of the 12-itemed model was further substantiated by studying the characteristics of their intercorrelational matrix (see table 1). Interitem correlations ranged between (.159 and .729) with a mean of (0.440 ±.133), a value that surpasses a 0.3 threshold. Most interitem correlations were statistically significant ($p < .05$, one-tailed) and of considerable magnitude (i.e. > .3). Corrected item-total correlations were statistically significant ($p = .000$, two-tailed) and sizeable as they outstripped a 0.3 threshold and lied in the range from 0.450 to 0.806, with a mean of (0.629±.110).

The determinant of the inter-item correlation matrix was 0.001 (i.e. greater than 0.00001) denoting that the correlation matrix is not an identity matrix and that the dataset of the twelve observed variables was not afflicted with multicollinarity or singularity problems. Also the internal consistency of the 12-item scale was demonstrated by finding that Chronbach's alpha if item deleted did not exceed the 0.9 mark for any item except item{M9}where Chronbach's alpha if item deleted was 0.904. A highly significant Bartlett's Sphericity test (χ^2= 369.062, d.f = 66, p = .000) suggested that the correlation matrix was not an identity matrix and that there was a patterned relation among the retained twelve items. Sampling adequacy was further corroborated by a Kaiser-Mayer-Olkin (KMO) coefficient of 0.869, a value that exceeded a meritorious 0.8 threshold. Additionally, inspecting the anti-image correlation matrix for measures of individual sampling adequacy (MSA) revealed that all values on the diagonal exceeded 0.5 and lied in the range (0.796 to 0.913) which provided an evidence of sampling adequacy at individual item level.

Extraction communalities (using PAF) for all variables were above 0.30, lying in the range (.322 to .741) except the communality of item {M9} which was 0.224. Counting item {M9}, communalities' mean ± SD was.5488± .16608. High communalities that exceeded the .3 mark give a further support of sampling adequacy, as well as a strong sense of belonging and harmony among manifest variables.

Residual analysis surfaced no problem since correlations residuals were zero or close to zero. The average correlations residual is approximately zero (0.000364±0.058408), the maximum is .185 and the minimum is -0.115. The values of absolute residuals range between a maximum of |0.185| and a minimum of |0.002| and the average of absolute residuals is |0.04576± 0.03586|. The histogram illustrated that the correlation residuals were normally distributed and the normal Q-Q plot of residuals produced an approximately straight line denoting that the residuals formed a normal distribution with a mean of zero. There were 25 (37.0%) nonredundant residuals with absolute values greater than 0.05, suggesting that a twelve-item model is a good data fit since a good fit requires less than 50 % of non-redundant residuals to be greater than |0.05|. Altogether, these signs attest to the factorability of the twelve-item dataset since it satisfies the assumptions of univariate, bivariate and multivariate normality; bivariate linearity and homoscedasticity; no multicolinearity and no singularity; and sampling adequacy (at the global and individual) levels. The dataset is acknowledged to be suitable for conducting FA and Maximum Likelihood Estimation (MLE) based SEM.

Using Principle Axis Factoring(PAF), two factors were extracted depending on several criteria.Applying Kaiser Criterion, two factors with eigenvalues exceeding one were extracted (see table 2). The scree-plot of eigenvalues firmed up retaining two factors. A third criterion that supported the retention of two factors is that of retaining a factor as long as it explains no less than 10 % of variance. As per this criterion two factors were retained for the first factor explains 49.521% of variance and the second explains 10.365 % of variance; altogether, these two factors explain 59.887% of variance (see table 2).According to the criterion of explained variance a good factor solution is one that explains most overall variance with the fewest number of factors. Accounting for half of variability (about 50 % of explained variance) is considered satisfactory when exploring social phenomena (Tabachnick & Fidell, 2007). The retention of two factors is also guided by theory. A two-factor solution is interpretable and is consistent with theory (Chiril & Constantin, 2013). Parallel analysis (Table 2) pointed to a one-factor solution, however, a one-factor solution is not backed by theory and previous research maintained that WPPV cannot be gauged as a unidimensional concept (Einarsen, Hoel, Zapf, & Cooper, 2003).In addition, some studies claimed that parallel analysis may have a tendency toward factor underextraction (Beauducel, 2001; Yang&Xia,2015). In any case running CFA in an exploratory mode disclosed that the unidimensional solution was a thoroughly non-fitting structure.

The determination of the number of factors was also informed by exploring the three-factor solution that is deemed untenable for the reason that only one variable loads on the third factor making this factor both unreliable and uninterpretable. Factors that have less than three variables are generally viewed as undesirable and unreliable (Young & Pearce, 2013). If only one variable loads highly on a factor, the factor is contemplated as poorly defined (de Carvalho & Chima, 2014). Discounting the one-factor and three-factor solutions supported the selection of the two-factor solution as the model that optimally represents the data.

The unrotated PAF solution(see table 3) disclosed that twelve items loadings on the first factor ranged from 0.460 to 0.847, while their loadings on the second factor ranged from |.008 to .417|.The loadings on one unrotated factor speaks of certain coherence among its dimensions (Lee, 2012).However, rotation assists extracted factors to be more interpretable (de Carvalho & Chima, 2014).Oblique rotation is elected because theory and previous research have shown that the WPPV factors were moderately correlated i.e. correlation coefficient > 0.3 (Escartín, Rodríguez-Carballeira, Gómez-Benito, & Zapf, 2010; Korukcu et al., 2014; Zapf, Escartn, Einarsen, Hoel, &Vartia, 2010).

Factor loading after rotation using direct oblimin method and a significant factor criterion of 0.386 are shown in table (3). In the present study, oblique rotation illustrated that the two-factors were moderately and significantly correlated ($r = -0.624$, $p < .001$, two-tailed. The two latent variables are not highly correlated indicating that the model does not have too many factors and a two factor solution is a suitable one (Lix, 2007). Discounting factor loadings below 0.386, the configuration identified by EFA depicted a two-factor model with five indicators loading on the first factor (F1), six indicators loading on the second factor (F2) whereas {M4} is a complex variable loading notably (i.e. > 0.4) on both factors (see Table3). Being a complex variable, item M4 was dropped from the measurement model. The exclusion of a parameter that does not favor a good model's fit is recommended and adopted, and should be performed whenever such a decision is supported from a statistical as well as theoretical viewpoints (Byrne, 2010). The ruling out decision is also justified from a theoretical viewpoint since the wording of item {M4} is very similar to that of item {M10}.

Pertinent theory and literature demonstrate that bullying acts can be grouped at least under two dimensions factoring acts that are targeted either to the person (direct attack), or to the person's occupational situation (indirect attack) (Chiril & Constantin, 2013; Work Safe New Zealand, 2014).The extracted two factors are readily interpretable and labeled. The first factor (F1) embraces bullying actions aimed at undermining the personality of the victim and is labeled “Personal Attack”. The second factor (F2) incorporates bulling acts aimed at undermining the victim’s job and is labeled “Task-related Attack” (see Table 3).

Thereafter, the initial theoretical structure identified by EFA is subjected to confirmation and construct validation using CFA via SEM employing AMOS Version 24thru MLE.At this juncture it should be recounted that using the same dataset for CFA after conducting EFAis not methodologically problematic and does not comprise a capitalization on chance for this particular instance since the collection of a second "sample" is unwarranted so long as all eligible participants actually contributed to the dataset and the results are not intended to be generalized beyond the study setting.

A two-factor model is specified with five indicators (M1, M2, M3, M6, M10) loading on (F1), and six indicators (M5, M7, M8, M9, M11, M12) loading on (F2) (see figure 1). The specified model was identified by fixing factor variances and regression weights of error terms to one each, while all other parameters were freely estimated. The model was estimated and a minimum is achieved. Generally, CFA results uncovered a satisfactory fit of the measurement model. The following fit indices were registered. $\chi^2_{(43)}$= 62.983, p = .025), (χ^2/df) =1.465,

SRMR=.0576, CFI= .930, TLI= .911, IFI= .933, and RMSEA = .089 with 90 % C.I. (lower bound = .033 and upper bound = .134, *p-close*= .104).RMSEA presented a mixed picture as the lower bound of the 90% confidence interval for this statistic was .033 and the close-fit hypothesis is not rejected (since *p-close* denotes statistical nonsignificance). Also, the poor-fit hypothesis cannot be rejected since the upper bound exceeded .10, so the poor-fit hypothesis cannot be rejected. In spite of the mixed picture of RMSEA the overall fit of the model is pondered satisfactory.

Correspondingly, local fit was satisfactory since all standardized regression paths of the measurement model were significant ($p < .001$, two-tailed) and exceeded the 0.4 cutoff point and ranged between .472 and .865 (see table 4).Besides, the correlation between the two factors was moderate .769 and significant $p < .001$, two tailed.

Inspecting the residual covariance matrix (i.e. the disparities between observed and reproduced covariances)exposed relatively small values (mean = 0.00317 ± .11699, with a range of .4660 to -.2720). In absolute values the mean of residual covariances was 0.073 ± .09045, with a range of 0.000 and |.4660|. Small covariance residuals reflect a good fitting model that is neither underparameterized nor overparameterized. Moreover, elements of the covariance residual matrix are normally and uniformly distributed near zero, and have uniform variances across all levels of the predictors, i.e. they are homoscedastic. Also the normal Q-Q plot of the standardized covariance residuals produced an approximately straight line denoting that the residuals are coming from a normal distribution with a mean of zero, a finding that adds extra evidence to the adequacy of model fit. Standardized residual covariances(*z* statistics)(i.e. residual covariances divided by their respective standard errors) ranged between 1 - 1.962 in absolute value),in other words they were less than a cutoff point of |2| a finding that bestows another clue of a good model fit. As regards correlation residuals (i.e. the differences between sample-implied and model-implied correlations), most of them were approximately zero, and only five lied in the range of |.266 - .155|) and exceeded a |.1| threshold. Mean correlation residuals was -.0015 ± .0719 (maximum = .1740 and minimum = -.2660). Mean correlation residuals - in absolute value - was .0463 ± .05479 (maximum = |.2660| and minimum = 0). Correlations residuals can be interpreted as the "amount" of correlation that cannot be accounted for with the model; however, these levels of correlation residuals are not thought to be serious sources of model misspecification.

Consulting MI supported this conclusion since expected parameter changes (EPCs) were inconsequential. Largest MI was a Lagrange multiplier of 8.421 for allowing error terms of indicators M10 and M11 to covary where EPC is .424. Improvement of fit of the model with error covariance between indicators M10 and M11 over the model with no error covariance was examined using chi-square difference (χ^2diff) test for nested models, where:-

$$\chi^2\text{diff.} = \chi^2_{(43)} - \chi^2_{(42)} = 62.983_{(43)} - 53.853_{(42)} = 9.13_{(1)}, \textit{ns}.$$

The critical value for the $\chi2$ diff is 10.83 ($\alpha = .001$, $df = 1$). Because the $\chi2$ diff test value 9.13 is < 10.83, it can be concluded that the two-factor model with an error covariance between items M10 and M11 does not provide a significantly better fit to the data than the two-factor model without the error covariance. In other words, an insignificant χ^2diff.testindicates that adding a covariance path between the just mentioned two error terms does not significantly improve the model fit and the simpler more parsimonious model is preferred to the more complex one.It is notable that other modification indices were in the range of 6.963 – 4.801; and EPCs were in the range | .267 - .193|.

Additional analysis headed to establish another two components of construct validity, namely, convergent validity and discriminant validity. Cronbach's alpha reliability coefficient (α) for (F1) was (0.795) and (F2) was (0.865), supporting eminent internal consistency reliability for both constructs and proving their convergent validity. Raykov's factor rho coefficient of composite reliability was 0.804for F1 and 0.869for F2. A factor rho coefficient> .8) is supportive of construct reliability and convergent validity of both dimensions. Evidence of convergent validity was further reinforced by high and significant standardized factor loadings (Field, 2005). Table 4displays that all standardized loadings were above.47. Guadagnoli and Velicer (1988) advocate acceding reliability (and thence convergent validity) of a construct if it has four or more loadings with values ≥ 0.6 regardless of sample size. Similarly, Steven (1992) suggests using a factor loading cut-off of 0.4, irrespective of sample size. Theseprovisos apply to both dimensions of the current measurement model. Standardized factor loadings on F1 are above .66 for four indicators and the fifth indicator's loading is .547.Standardized factor loadings on F2 are above .647 for five indicators and the sixth indicator's loading is .472.

The discriminant validity of the constructs is maintained by observing that the correlation coefficient between both constructs is moderate and equals 0.769. Estimated correlation between the two factors is not excessively high, i.e. lower than 0.85 a finding - according to Kline (2011) and Ullman (2006)- supports the model's discriminant validity. Discriminant validity is further supported by the finding that the one-factor solution is thoroughly non-fitting.

As the eleven-item measurement model met the condition of congenerity, the investigation proceeded to assess it for tau-equivalence and parallelism. Tau-equivalence was tested by imposing equality constraints on the unstandardized factor loadings (i.e., they were all fixed to 1.0 and factor variances were freely estimated). It was realized that the fit of the tau equivalent model was not significantly worse than of the congeneric model. For the congeneric model: $\chi^2_{(43)}$= 62.983, p = .025; for the tau-equivalent model: $\chi^2_{(52)}$= 78.928, p = .009. χ^2diff. = $\chi^2_{(52)}$ - $\chi^2_{(43)}$ = $78.928_{(52)}$- $62.983_{(43)}$= $15.945_{(9)}$, *ns*. Calculated chi < critical chi, at .001; (i.e., 15.945<27.877). Because tau-equivalence was established, the analysis proceeded to evaluating the condition of parallel indicators. The model was tested for parallelism by constraining error variances to equality and it was discerned that the fit of the model with parallel indicators (i.e. with equality-constrained residuals)was not significantly worse than that of the tau equivalent model, and the indicators are proved to be parallel. For the tau-equivalent model: $\chi^2_{(52)}$= 78.928, p = .009; for the parallel model, $\chi^2_{(62)}$= 103.716, p = .001. χ^2diff. = $\chi^2_{(62)}$ - $\chi^2_{(52)}$ = $103.716_{(62)}$– $78.928_{(52)}$= $24.788_{(10)}$,*ns*. Calculated chi < critical chi, at .001; (i.e., 24.788 < 29.588). The fulfillment of the conditions of tau-equivalence and parallelism capacitated the option of assigning indicators equal weight when calculating total WPPV score.

The validated two-factor model was used to calculate the average total WPPV score for each case by dividing sum of attained scores of the eleven items by eleven (i.e. number of items). The number and percentage of physicians exposed to various degrees of WPPV were assorted according to average case total WPPV score categories previously detailed in the methods section. It was realized that thirty-eight physicians (63.3 %) were not exposed to WPPV, while seventeen (28.3 %), three (5.0 %) and two (3.3 %) physicians, were exposed to mild, moderate and severe degrees of WPPV respectively. Victims were roughly evenly exposed to Personal and Task-related Attacks; (33.3 %) and (36.7 %) respectively. Mean WPPV score comparison, revealed that physicians working in the surgical department were exposed to significantly higher degrees of WPPV($\bar{x} \pm s$ =24.76 ± 8.80) than physicians working in the internal medicine department ($\bar{x} \pm s$ =14.70 ± 7.84) [t= 4.748, p = .000, two-tailed, d.f. = 58].Male physicians were exposed to significantly higher degrees of WPPT($\bar{x} \pm s$ =22.56 ± 9.76)than females ($\bar{x} \pm s$ =15.21 ± 7.68) [t = 2.889, p = .005, two-tailed, d.f=58]. Physicians with a merit of "very good" were exposed to significantly higher degrees of bullying ($\bar{x} \pm s$ =25.06 ± 9.40) than those with a merit degree of "excellence” ($\bar{x} \pm s$ =17.98 ± 8.47) [t = - 3.055, p =.003, two-tailed, d.f. = 58].

Discussion

Societies are turning out to be more violent (Levy & Sidel, 1997; WHO, 2002a, 2002b). Violence, in its various forms, is becoming a priority problem at the community as well as the organizational levels all over the world (Rosenberg, 1985; Rosenberg & Fenley, 1991; Rutherford, Zwi, Grove, & Butchart, 2007; Satcher, 1995; WHO, 1996). Workplaces, counting university hospitals, are not imperviousto various types of violence including psychological violence (European Foundation for the Improvement of Living and Working conditions, 2003; United States Office of Personnel Management, 1998; WHO, 2002a, 2002b).

To the best of researcher's knowledge, the present study is the first study in Egypt to exclusively investigate WPPV against physicians. In Assiut Governarate of Upper Egypt, El-Houfey, Abo El-Maged, Elserogy, and El Ansari(2015) studied WPPV among nurses and resident physicians working at Emergency Departments in Assiut University Hospital. However, the majority (80%) of participants in El-Houfey, et al.'s study were nurses. In another vein, there were two studies concerned with general violence (physical and verbal) directed only against Egyptian nurses (Abbas, Fiala, Abdel Rahman, &Fahim, 2010; Samir, Moustafa, &AbouSaif, 2012). The scantiness of analogous studies is not flabbergasting in view of the fact that developing countries suffer from a dire paucity of studies on WPPV (Gupta, Bakhshi, &Einarsen, 2017).In Egypt - before the present study-there were no studies on WPPV outside the health sector. WPPV occurs to workers throughout the globe (Cortina, &Magley, 2003),nonetheless, there are differences in exposure patterns in various contexts since diverse negative acts take place in dissimilar organizational contexts (Chiril & Constantin, 2013; Crawshaw, 2009). Previous research has shown that a number of items of the LIPT may be context-irrelevant when applied in distinctive organizational locales and their inclusion leads to decline of the psychometric properties of the scale (Rodríguez-Carballeira, Escartín, Visauta, Porrúa, &Martín-Peña, 2010). In this study, thirty-three of the bullying acts listed in 45-item LIPT were found to be non-prevalent in the study setting and were excluded from further analysis. The conceptualized 11-itemed measurement model serves to crystalize the conceptual construction of the problem which is an important step towards developing concrete solutions pertaining to the specified study setting.

An appropriate prevention intervention strategy needs to recognize that the value of a particular situational measure is highly contingent on the particular nature of the problem and the setting in which it arises which, in turn, will help in developing tailor-made solutions for the problem (Clarke, 1997).Situational measures cannot be applied wholesale; they need to be tailored to the particular circumstances giving rise to specific problems of misconduct and transgression and instruments designed to assess bullying acts should actually correspond to existing definitions and real-life situations (Clarke, 1997). CFA allows one’s measurement theory to be thoroughly tested for fit and construct validity; however, the researcher still carries the burden of making sure that the content of each scale truly matches the definition of a theoretically relevant construct. Thus, face validity remains a crucial question and SEM procedures in and of themselves cannot replace a common sense examination of item and definition content(Babin, &Svensson, 2012). Not a few studies adapted LIPT so that only fit items are counted in the measuring model (Björkqvist et al.,1994; González de Rivera, 2005; TrujilloFlores, Tovar, &Vilchis, 2014; Van Dick& Wagner, 2004). Babin and Svensson (2012) contend that there is a chronic cumulative gap in the measurement and structural models between the “ideal” or “perfect” and “real” validity and reliability throughout the research process.

Factor analytic studies have shown WPPV to be a multidimensional construct that could be exhibited through various multifactorial structures correlated to varied items of negative acts (Einarsen, 1996; Salin, 2003).Research has shown that harassing acts are rarely grouped under one dimension (Einarsen et al., 2009). WPPV is usually structured into multiple moderately-related constructs whose number varies from two to eight depending upon the unique study setting (Aksu, &Akyol, 2011; Chiril & Constantin, 2013; Jeniffer et al., 2003; Korukcu et al., 2014; Rogelberg, 2007).

Additionally, this study has demonstrated that the two-factor measurement model is a plausible model that provides an adequate fit for the empirical data. Bullying acts are grouped into two moderately correlated dimensions, namely "Personal Attack" and "Task-related Attack" a pattern that was revealed in earlier studies (Chiril & Constantin, 2013; Einarsen et al., 2003).Victims are nearly equivalently exposed to both dimensions of WPPV adding evidence to the proposition that if individuals are bullied they tend to experience a large number of bullying behaviors from various behavioral categories; a proposal that is congruent with the moderate correlation of the bullying dimensions and documented by foregoing studies (Escartín et al., 2010; Zapf et al., 2010). Thus the acceptability of the two-factor model is not based solely on adequacy of fit and factorial validity but also on theoretical considerations.

The prevalence of WPPV in the study setting was 36.7 % a percentage comparable to other settings in diverse parts of the globe. Approximately one third of physicians were exposed to WPPV in hospital settings in U.K. (Quine, 1999; Quine, 2002). Likewise 37 % of U.S. workforce were exposed to workplace bullying (WBI, 2012).The present study revealed that male physicianswere more exposed to WPPV than females, a finding that contradicts mainstream previous research in other parts of the world documenting that females are more exposed to WPPV than males (Aquino & Bradfield, 2000; Cortina, Magley, Williams, &Langhout, 2001; Hoel & Cooper, 2000;Korukcu et al.,2014; Moreno-Jiménez, Rodrıguez, O'Connell, Calvert, & Watson, 2007; Moreno-Jiménez, Rodriguez, Salin, & MoranteBenadero, 2008, Salin, 2008,Yıldırım, Yıldırım, &Timucin, 2007; Zapf, Kornz & Kulla,1996).

However, in several countries, for example the UK (Hoel& Cooper, 2000), Sweden (Leymann, 1992), Norway (Nielsen, et al., 2009), and Belgium (Notelaers, Vermunt, Baillien, Einarsen & DeWitte, 2011)large-scale nationwide studies, covering multiple industries and sectors, have reported no or only non-significant differences between males and females in terms of prevalence of WPPV.Only in a few of occupational studies have higher prevalence rates been reported for men than for women, for example within childcare (Lindroth & Leymann, 1993) and among assistant or ancillary nurses (Eriksen & Einarsen, 2004), both female-dominated sectors.Though, little is known about how national culture and the national gender climate affects the way men and women experience bullying(Di Martino, Hoel, H, Cooper, C.L., 2003),lower female exposure in the study setting may be attributed to a traditional culture regarding evaluation of where females and their rights fit in a conservative Egyptian society (Abu-Lughod, 1998). The cultural nature of misconduct (Hayward & Young, 2004), and the fact that transgression do occur within a social space are well-recognized (Ferrel & Sanders, 1995; Ferrel, 1999) .WPPT needs to be viewed against a background of sociological elements such as culture, legal framework and socio-economic context (Einarsen, Hoel, Zapf, & Coope, 2011).Misbehavior in social life has to be interpreted through the lens of culture (O' Brien, 2005), and the present study provides extra evidence supporting the notion that bullying - though it afflicts both men and women - is not a gender-neutral phenomenon,.

In addition the study revealed that junior physicians working in surgical section are more exposed to WPPV than those working in the internal medicine one, a finding that is congruent with earlier studies in various parts of the globe verifying that surgical departments have a protracted history of undermining and bullying behaviors (Jankowiak et al., 2007; Musselman, MacRae, Reznick, & Lingard, 2005; Myers, 1996; Wild, Ferguson, McDermott,&Hornby, 2015).

Also the study communicated that junior physicians with a “very good” merit are more exposed to WPPV than those with an “excellent” merit; a finding that could be explained from a power and status disparity perspective as physicians with a “very good” merit occupy lower positions in the organization hierarchy than those with an “excellent” merit and possess less organizational power and status (specifically in terms of positional and informational power) and thence more vulnerable to victimization. The organizational power and status differential is a critical and central component of WPPV since bullying typicallyinvolves dominance of one or more persons over the less powerful, and without such dominance, bullying attempts are unsuccessful (Hall, &Lewis, 2014; Rodkin, Espelage, & Hanish, 2015). Perceived and actual power/status differentials are not only due to formal power imbalances but can also be created by situational and contextual characteristics that expedite bullying as a downwards rather than an upwards process (Salin & Hoel, 2013). However, this finding may be a reflection of the point that power deficit sensitizes a person to a perceived threat and consequently low-power individuals tend to feel more exposed to threats (Anderson, &Berdahl, 2002; Keltner, Gruenfeld, & Anderson, 2003; Salin, 2003).

Identifying group based differences in mobbing exposure is important for pinpointing higher risk segments of the study population. Recognizing higher-risk segments enables administrators and mangers to develop and target customized preventions and interventions capable of addressing the specified needs of a certain setting. Context-sensitive situational prevention intervention initiatives are recommended because the structure and pattern of WPPV differ in diverse countries and altered contexts (Clarke, 1997; Patrick, Susan, Rocky, &Tommy,2017).

The present study brought to light that WPPV is not infrequent in the study setting and justifies the institution of prevention and intervention measures such as education and awarenessraising campaigns providing written and oral information to enhance ability and skill to recognize and cope with bullying acts; especially those acts identified to be prevalent in the study setting.

Educational and training tools such as workshops, courses and brochures on topics of WPPV, communication competences, stress management, assertiveness skills and conflict resolution tactics should be introduced and disseminated as informational support for junior physicians, with special emphasis onthe identified higher risk category, namely, a male junior physician with a “very good” merit who is working in the surgery section. A zero tolerance philosophy should be endorsed and institutionalized via written organizational policies, strategies, guidelines, regulations, statutes, codes of practice, reporting and documenting procedures particularly developed and tailored to suit the setting’s unique needs (Patrick, et al., 2017; Ritzman, 2016; Work Safe Alberta, 2010), underscoring the adverse factors of personal and task-related attacks and their related eleven negative acts depicted in the measurement model.

Senior executives - including hospital managers and department heads - should facilitate communicating anti-WPPV measures to their employees and actuating legal options including consistent and appropriate disciplinary procedures and actions against perpetrators of workplace mobbing (Work Safe Alberta, 2010). Failure to have such measures may signal lack of organization’s commitment to create mobbing-free work environment (Patrick, et al.,2017; Ritzman, 2016).Planning to assess and counter WPPV is most effective if it is based on a multidisciplinary approach drawing expertise from a number of perspectives including organizational behavior, human resources, public health and law enforcement agencies (Work Safe Alberta, 2010). Instituting the above-mentioned prevention and control measures imparts a safer work environment conducive to better employee and organizational wellbeing (O’Higgins &Kiernan,2015; Patrick, et al., 2017).The measurement model depicted in this study demonstrated adequate reliability and validity and can be utilized as a standard tool to gather data about prevailing negative acts and provide vital quantitative information for monitoring, assessing and evaluating effectiveness of opined prevention intervention initiatives in the study setting. Nonetheless, a replication study is recommended to scrutinize the stability of the proposed model.

A limitation of this study is that the number of cases is not large enough to randomly split and cross-validate the analyses, though it should be recounted that sixty cases is the maximal number of participants who could contribute to the present study in the designated setting and a sample is considered sufficient as long as it includes all cases that can contribute to the study (Kenny, 2015).According to Kline (2005), SEM is a large sample technique; however, quite small "sample" size of the study does not detract from the soundness of study results. Conclusions extrapolated from the study model cannot be considered unreliable so long as the assumptions of ML are not challenged (de Carvalho & Chima, 2014). Data analysis demonstrated univariate, bivariate and multivariate normality among the indicator variables.Now, it is known that SEM can in some situations be run with smaller samples (Babin, & Svensson, 2012). Sapnas and Zeller(2002),pointed out that even fifty cases may be adequate for FA.Still more, a number of studies have addressed the role of sample size less than 50 in FA in terms of parameter recovery (Jung, & Lee, 2011). de Winter, Dodou, &Wieringa (2009) freshly concluded that under the conditions of high communality, high number of observed variables, and small number of factors, FA can yield stable estimates of population loadings for sample sizes < 50.In the same way, MacCallum, Widaman, Zhang, and Hong (1999), demonstrated that level of communality is the most important determinant of factor recovery in the issue of sample size.

On the word of Babin and Svensson (2012) small samples may detract from the generalizability of results; yet, the results of the present study are not meant to be generalized beyond the stated study setting. Victimological research manifests that “macro” or “meso” level data rarely or infrequently – respectively- produce findings with preventive implications, while “micro” level analyses of specific misbehaviors occurring in special kinds of settings are usually the most productive in preventive terms (Clarke, 1997).

Another limitation is that the concurrent validity of the adapted elven item measurement model could not be established because the study used no other scale or questionnaire that specifically measures bullying in hospital settings and an additional study is recommended to investigate concordance with other scales of workplace bullying. A third limitation is that the findings are not generalizable beyond the study setting since the study involved only surgical and medical departments in one university hospital. Future research efforts are needed to retest the measurement model unveiledby this study in other departments in AMUHand other Egyptian university and non-university hospitals to obtain more generalizable results. Workplace bullying in academia is still regarded as a problem with little available empirical research (Giorgi, 2012), and thepresent study facilitates the expansion the scientific knowledge by revealing the theoretical structure and prevalence of WPPV in a particular academic hospital setting in Egypt.

Conclusion

WPPV is a prevalent problem among surgical and medical resident physicians in AMUH. This study demonstrated that WPPV is a complex construct that constitutes a nagging part of many junior physicians' working life.Eleven negative acts have been found to be more predominant in the study setting and they have been congregated under two factors, namely, Personal Attack and Task-related Attack, thusauthenticating the multidimensional nature of the construct of WPPV. Application of the two-factor measurement model disclosed thatWPPV prevalence rate in an Egyptian settingis akin to other parts of the globe. It has also been brought to light that surgical residents were more exposed to WPPV than their internal medicine counterparts. Residents with a “very good” merit at M.B.Ch.B. were more exposed to WPPV than theircolleagues with an “excellent merit”. Contrary to findings of other studies in other parts of the world, this study showed that female physicians working in an Egyptian locale were less exposed to WPPV than their male coworkers. Preventive and interventive policies, procedures and programs are to be customized in accordance with prevailing negative acts and their underlying constructs.Assiduous preventive and control measures should be specially directed to male surgical residents with a very good merit at their M.B.Ch.B.

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Tables

Table (1): Factor analysis Input Data: Means, standard deviations, and twelve items interitem correlations, and one-tailed significance (N= 60)

Variable	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
M1	1.000	(.000)	(.000)	(.001)	(.003)	(.000)	(.001)	(.000)	(.019)	(.004)	(.000)	(.112)
M2	.439	1.000	(.000)	(.000)	(.002)	(.001)	(.006)	(.001)	(.077)	(.002)	(.000)	(.003)
M3	.525	.573	1.000	(.000)	(.000)	(.000)	(.003)	(.000)	(.047)	(.002)	(.000)	(.009)
M4	.380	.423	.568	1.000	(.000)	(.000)	(.000)	(.000)	(.004)	(.000)	(.000)	(.000)
M5	.358	.369	.600	.729	1.000	(.000)	(.000)	(.000)	(.008)	(.006)	(.000)	(.000)
M6	.471	.390	.547	.513	.520	1.000	(.001)	(.000)	(.018)	(.001)	(.005)	(.096)
M7	.386	.321	.350	.540	.659	.393	1.000	(.000)	(.001)	(.012)	(.000)	(.000)
M8	.485	.414	.587	.654	.673	.559	.725	1.000	(.000)	(.000)	(.000)	(.000)
M9	.270	.187	.218	.335	.312	.271	.409	.439	1.000	(.000)	(.012)	(.006)
M10	.342	.375	.370	.476	.319	.409	.289	.439	.433	1.000	(.000)	(.018)
M11	.437	.420	.430	.602	.537	.327	.615	.571	.293	.564	1.000	(.000)
M12	.159	.346	.305	.436	.530	.170	.610	.515	.325	.271	.509	1.000
Mean ± SD	1.57± 1.11	1.88± 1.18	1.68± 1.10	1.53± 1.28	1.75± 1.22	1.73± 1.07	1.87± 1.52	1.90± 1.40	2.37± 1.28	1.85± 1.30	1.58± 1.37	2.05± 1.47

One tailed significance of the correlation coefficients are given in parenthesis.
Mean inter-item correlation = 0.44
Determinant of the inter-item correlation matrix = 0.001

Table 2. Total Variance Explained **(**Extraction Method: Principal Axis Factoring**)**

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]	Simulated Eigenvalues in Parallel Analysis [b]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	x̄± s
1	5.943	49.521	49.521	5.509	45.912	45.912	4.624	1.8132 ± .1205
2	1.244	10.365	59.887	.790	6.586	52.498	4.622	1.5723 ± .0827
3	.962	8.020	67.907					1.3968 ± .0669
4	.803	6.692	74.599					1.2494 ± .0615
5	.676	5.634	80.233					1.1225 ± .0537
6	.615	5.122	85.355					1.0041 ± .0546
7	.443	3.692	89.046					0.8935 ± .0499
8	.354	2.949	91.995					0.7896 ± .0503
9	.310	2.585	94.580					0.6899 ±.0501
10	.265	2.207	96.787					0.5928 ± .0502
11	.228	1.896	98.684					0.4937 ± .0516
12	.158	1.316	100.000					0.3822 ± .0553

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.
b. Averaged variances of simulated eigenvalues, their standard deviations using normally distributed random numbers for 12 variables in a sample size of 60 and 500 replications in parallel analysis.

Extraction method: Principle Axis Factoring (PAF); Rotation method:Direct oblimin with Kaiser normalization.Rotation converged in 11 iterations.

Table 3. Pattern matrix for the twelve observed variables of the measurement model

Observed variable	Unrotated solution		Rotated solution	
	First factor	Second factor	Factor 1 (Personal Attack)	Factor 2 (Task-related Attack)
M3	.714	.388	.843	
M6	.631	.312	.711	
M1	.577	.299	.665	
M2	.573	.240	.595	
M4	.787	.008	.446	-.427
M10	.564	.103	.432	
M7	.760	-.406		-.889
M12	.591	-.417		-.809
M8	.847	-.078		-.560
M5	.788	-.103-		-.556
M11	.727	-.129		-.552
M9	.460	-.114		-.386

Extraction method: Principle Axis Factoring (PAF); Rotation method:Direct oblimin with Kaiser normalization.Rotation converged in 11 iterations.

Table 4. Unstandarized and standarised regression weights of the measurement model

Regression line	Unstandardized estimate	S.E.	C.R.	P	Standardized estimate	Squared multiple correlation
F1 ---> M1	.728	.137	5.324	***	.661	.437
F1 ---> M2	.767	.146	5.252	***	.656	.430
F1 ---> M3	.861	.128	6.749	***	.791	.626
F1 ---> M6	.734	.130	5.626	***	.691	.477
F1 ---> M10	.961	.160	6.017	***	.547	.300
F2 ---> M5	.953	.135	7.043	***	.790	.624
F2 ---> M7	1.255	.166	7.570	***	.830	.690
F2 ---> M8	1.199	.149	8.073	***	.865	.748
F2 ---> M9	.597	.162	3.672	***	.472	.223
F2 ---> M11	.961	.160	6.017	***	.708	.501
F2 ---> M12	.942	.176	5.340	***	.648	.419

*** The regression weight is significantly different from zero at the 0.001 level (two-tailed).

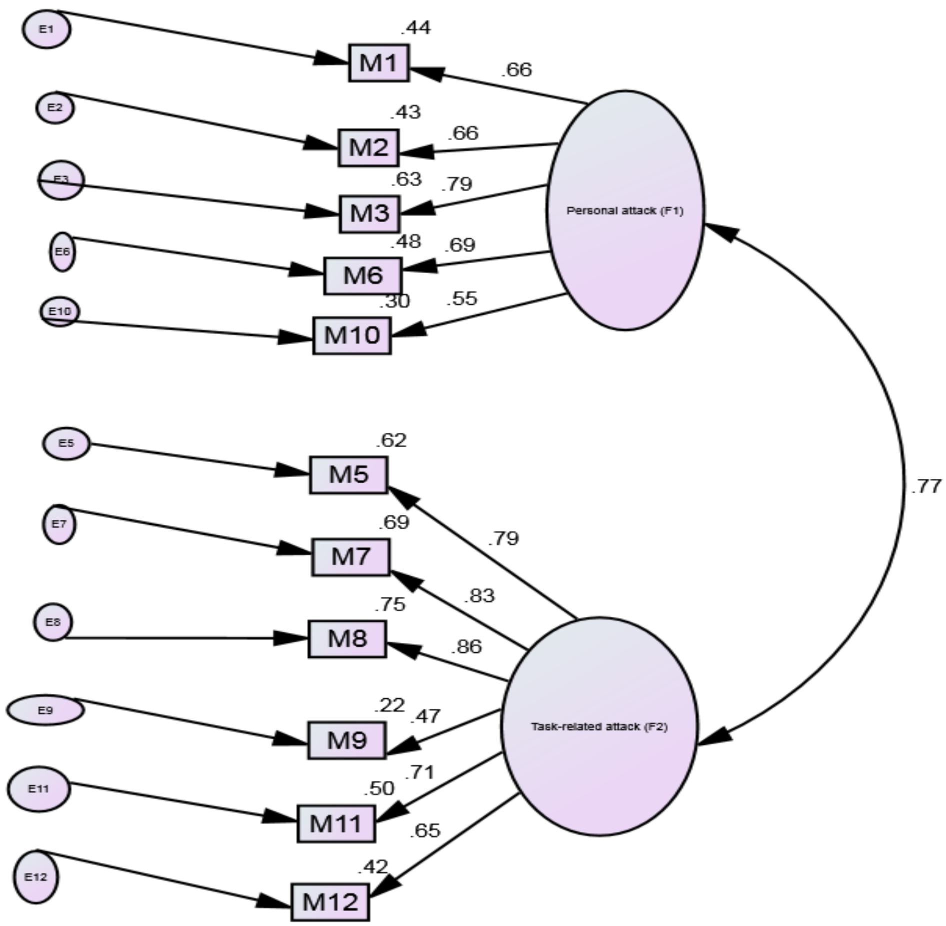

Figure 1. Two-factor measurement model of workplace psychological violence with standarised estimates