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Original Research

Workplace mistreatment and health-related quality of life (HRQL): Results from the 2010 National Health Interview Survey (NHIS)

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Abstract

Objective: The objective was to investigate the association between workplace mistreatment and health-related quality of life (HRQL) measures among the US working population.
Methods: A total of 13,807 currently working adults from the 2010 National Health Interview Survey (NHIS) responding to an item on workplace mistreatment were considered. Based on the components of a commonly used HRQL instrument (SF-20), physical and mental health statuses were assessed. Separate ordered logistic regressions were fitted for each of the health conditions/quality of life indicators, with workplace mistreatment as a main explanatory variable and demographic and individual variables serving as covariates. The study also estimated and compared HRQL scores for workers who reported mistreatment and workers who did not report having been mistreated.
Result: The estimated HRQL scores for mistreated workers were 77.8 and 87.1 for workers who did not report mistreatment. Assuming HRQL=100 as perfect health status, workplace mistreatment was associated with a 72% greater health deficit. Workers exposed to workplace mistreatment had higher odds of feeling sad (OR=1.9 (95% CI-1.54, 2.39)), nervous (OR=1.96 (95% CI-1.60, 2.42)), hopeless (OR=2 (95% CI-1.53, 2.60)) and worthless (OR=1.9 (95% CI-1.5, 2.6)). Mistreated workers were less energetic, more exhausted, and felt everything was an effort (OR=1.8 (95% CI-1.5, 2.3)). Their probability of reporting a health decline over the past year was more than two times (11% vs. 5%) that of workers who had not reported mistreatment, after controlling for personal and work characteristics.
Conclusion: The analyses suggested that workplace mistreatment was associated with negative health outcomes and a lower HRQL.

INTRODUCTION

Bullying or mistreatment includes physical, verbal, or psychological acts intended to cause fear, distress, or harm towards the target [1-2]. In the absence of a standard definition, workplace bullying is generally considered to include situations in which there is harassment or other negative acts directed at someone in the work environment [3]. In the United States, the prevalence of bullying or mistreatment at the workplace varies from 6% to 63% [4-6], depending on the definition used. Workplace mistreatment in terms of bullying/harassment has been associated with absence from work, turnover, and reduced productivity [7-9]. Studies have shown that targets of workplace mistreatment are more likely to report symptoms of depression, anxiety, and mental distress [10-15] and negative physical health symptoms such as fibromyalgia and cardiovascular problems [16-17].

There has been little literature examining the relationship between workplace mistreatment and health-related quality of life (HRQL), one of the four foundation health measures of Healthy People 2020 [18]. HRQL is a multi-dimensional concept that includes physical and mental functional status, as well

as self-perceptions of overall health [19-20]. Measuring HRQL related to workplace mistreatment could shed light on the health-related burden of workplace mistreatment and on the need for prevention.

There is no one set definition of HRQL and thus there are many instruments which have been created to measure HRQL. Instruments can either provide a generic, overall summary of HRQL or specifically focus on issues related to a particular health risk or area of function [21]. To the best of our knowledge, currently there exists no HRQL instrument that measures quality of life related to workplace bullying. Generic, validated HRQL instruments such as Medical Outcomes Study 36-Item Short Form (SF-36), SF-20 (a shorter version of SF-36), and EuroQoL (EQ-5D) evaluate health dimensions such as physical functioning, role limitations due to physical health status, social functioning, pain, general mental health status, role limitations due to emotional problems, vitality, general health perceptions, and self-care [21-24]. Some instruments, such as SF-36, provide scores for each of the dimensions evaluated by the instrument. Other instruments, such as EQ-5D, provide one single number that serves as the summary measure of health.

The current study looks at the relationships of workplace mistreatment and various generic health dimensions or quality of life indicators that are considered as main components of SF-20. The study estimates the HRQL score differences between respondents who reported having been mistreated and those who did not.

METHOD

This study analyzed data from the adult sample of the 2010 National Health Interview Survey (NHIS), conducted by the National Center for Health Statistics (NCHS). The NHIS, administered through multistage clustered sampling surveys of households, is one of the leading sources for health status indicator data for the non-institutionalized United States population. Conducted annually since 1957, NHIS includes supplemental questions each year, sponsored by various federal and private nonprofit organizations. In 2010, the National Institute for Occupational Safety and Health (NIOSH) sponsored a supplemental questionnaire on occupational health issues. One of the questions asked adult respondents, "During the past 12 months, were you threatened, bullied or harassed by anyone while you were on the job?" Incorporation of this variable provided the opportunity to examine the association between workplace mistreatment and various health-related outcomes that contribute to overall quality of life. Complete documentation on the NHIS is available at http://www.cdc.gov/nchs/nhis.htm. Overall, the study considered 13,807 adult respondents with complete information on all variables who responded that they were working during the week prior to the survey. Table 1 shows the occurrence of workplace mistreatment across demographic characteristics of the study population. It also provides a statistical summary for the variables in the regression analysis.

The study analyzed data from NHIS core questions which were distributed to all adult respondents. We followed the SF-20 (RAND)[1] in selecting health items representing the six health concepts covered by the SF-20. Table 2 shows the NHIS items and the corresponding SF-20 health elements that were addressed by the items. Rather than using four highly correlated overall health perception items as in SF-20, we used two similar items and added one item regarding sleep deprivation. Although sleep is not an SF-20 item, a growing literature shows the importance of sleep deprivation as an indicator of health status and also as a direct outcome of occupational health hazard exposures [25-27]. We used the scoring methodology (SF-20) followed by RAND to generate HRQL scores. The validity of the SF-20 construct is already established [21, 28].We compared the scores between the mistreated and the non-mistreated workers to determine the difference in HRQL that can be associated with workplace mistreatment.

Apart from looking at HRQL associated with mistreatment, we independently analyzed the association between various HRQL indicators and exposure to workplace mistreatment. We ran separate regressions for each of the quality of life related health items as mentioned in Table 2, which constituted our dependent variables. Our explanatory variable of interest was workers' report of being mistreated at work during the previous 12 months. Several personal and workplace variables were considered as covariates. These included individual and socio-demographic factors that affect perceived health status, such as age, gender, family size, race, income, and education. Also included were independent health indicators that affect mental, physical and social health perceptions, such as perceived overall health, body mass index, diabetes, high blood pressure, and smoking status. In addition to these personal variables, we included four workplace indicators: occupation (22 categories), firm size, availability of employer-sponsored health insurance, and access to paid sick leave. We also controlled for workplace exposures to toxic chemicals, vapor and smoke, as all these may contribute to perceived health status.

1http://www.rand.org/health/surveys_tools/mos/mos_core_20item_more.html

Table 1. Compares the distribution of mistreated (bullied/harassed/threatened) and non-mistreated workers across various demographic variables

Variable	Total[ab]	Mistreated[ab]	Non Mistreated[ab]
Total sample size count (%)	13,807	1,075 (7.8)	12,732 (92.2)
Demographic variables			
Male	6814	449 (6)	6365 (94)
Female	6993	626 (9)	6367 (91)
Age mean(sd)	41.9 (13.5)	42.34 (12.34)	41.78 (13.53)
Workers over 65 years (%)	674	19 (3)	655 (97)
Workers below 65 years (%)	13133	1056 (8)	12077 (92)
Family size mean	2.9	3	2.8
Education			
<11 yrs	981	40	941
HS attended or grad	477	33	444
College, associate degree , bachelors	7039	600	6439
>Masters	5284	402	4882
Annual Earning			
0-44999	7702	605	7097
45000-74000	2565	232	2333
>75000	1649	104	1545
Race			
White (non Hispanic)	8098	640	7458
Black	1755	159	1914
Hispanic	2624	189	2435
Others	8	7	93
Married	1171	87	1084
US Citizenship	12312	1010	11302
Health status indicators			
Overall self-rated health status was excellent or very good (%)	67	58	69
Health has deteriorated over last year (% yes)	6%	11%	5%
Body Mass Index [mean (sd)]	29.8 (13.5)	31.4 (15.1)	29.6 (13.4)
Diagnosed with high blood pressure (% yes)	23.9	28.2	23.6
Diagnosed with diabetes (% yes)	5.9	6.7	5.9
Nonsmoker (%)	85	81	86
HRQL indicators			
Physical Functioning – mean(sd) for scores 0-4 where 0->no problem and 4 ->maximum problem			
Vision	1.93 (0.25)	1.87 (0.33)	1.93 (0.24)
Hearing	1.63 (0.79)	1.77 (0.85)	1.62 (0.78)
Walking	0.18 (0.74)	0.33 (0.93)	0.17 (0.73)
Climbing	0.1 (0.52)	0.22 (0.74)	0.1 (0.5)
Reaching	0.07(0.40)	0.17 (0.62)	0.07 (0.38)
Grasping	0.07(0.36)	0.14 (0.5)	0.06 (0.34)
Carrying	0.09(0.48)	0.2 (0.7)	0.08 (0.46)
Emotional Status – mean(sd) for scores 1-5, where 5 ->no problem and 1->maximum problem			
Sadness	4.65 (0.72)	4.31 (1.00)	4.68 (0.69)
Nervousness	4.44 (0.86)	4.01 (1.11)	4.48 (0.83)
Restless	4.42 (0.94)	3.97 (1.21)	4.46 (0.90)
Hopeless	4.83(0.57)	4.58 (0.88)	4.85 (0.53)
Everything feels like Effort	4.55 (0.9)	4.18 (1.16)	4.59 (0.87)
Worthless	4.88(0.49)	4.66 (0.83)	4.89 (0.44)
Social Functioning Ability	0.11(0.67)	0.27 (1.01)	0.1 (0.63)
Depression/Anxiety/Mental problem causing limitation (% yes)	8.9	17.5	7.4
Limited in work due to health condition (% yes)	2.76	6.2	2.6
Joint Pain (% yes)	28.6	44.9	27.3
Mean hours of sleep	7.02	6.8	7.03
Workplace variables			
Access to employer sponsored health insurance (% yes)	68.87	75.6	67.7
Access to paid sick leave (% yes)	57.06	61.9	56.6
Exposures to smoke (% yes)	14.42	25.1	13.5
Exposures to vapor (% yes)	24.44	36.1	23.47
Exposures to chemical (% yes)	19.59	31.35	18.61
Firm size			
Small (1-499)	81.79	79.6	82
Medium (500-999)	5.10	6.3	5
Large(1000 & above)	13.11	14.05	13

[a]Includes currently employed adults
[b]Unweighted

Table 2. List of NHIS health items and their corresponding SF-20 HRQL components

Health items used to measure quality of life in this current study	Health dimension in HRQL instruments
Vision: Difficulty in seeing even with prescription glasses Hearing: Difficulty in hearing without hearing aid Walking: Difficulty in walking a quarter of a mile Climbing: Difficulty in walking up 10 steps Reaching: Difficulty in reaching over head Grasping: Difficulty in using fingers to grasp small objects Carrying: Difficulty in lifting or carrying something heavy as 10 lbs	Physical functioning
Limited in work due to physical health	Role limitations (physical and mental)
Depression/ Anxiety/ Mental health causes limitation	
Sadness: How often do you feel sad Nervousness: How often do you feel nervous Restless: How often do you feel restless Hopeless: How often do you feel hopeless Lack of Interest: How often do you feel everything is an effort Worthless: How often do you feel worthless	Emotional and mental health
Experience joint pain	Pain
How difficult is it to participate in social activities such as visiting friends, attending clubs and meetings, and going to parties	Social functioning
Perceived health compared to 12 months ago: Better, worse, about the same Overall health status	General health perceptions
Sleep problems Average number of hours of sleep	

Stata/IC version 10.0 was used for statistical analysis. Logistic regressions with forward stepwise iteration were used to identify the predictors of health variables, and ordered logistic regressions were used to identify the degree of association between workplace mistreatment and HRQL components.

RESULTS

The results of this study are presented in two parts. First, we looked at the association between reports of workplace mistreatment and various health conditions, and the results are presented in Table 3. The table depicts the associations between mistreatment and the HRQL components obtained from separate ordered logistic regressions presented in terms of odds ratio (OR), controlling for different covariates. Second, we estimated and compared HRQL scores for workers who reported workplace mistreatment with HRQL scores of workers who did not. Table 4 presents the computed HRQL scores while Table 5 depicts the statistical significance of the differences in HRQL scores.

Approximately 7.8% of survey population responded that they were mistreated at their workplace at least once during the previous year. This is similar to previous estimates from the NHIS [5, 6]. A higher percentage of female workers reported having been mistreated as compared to their male counterparts, and the difference was statistically significant (t-test, $t= 5.18$, $p <0.001$) at less than 1 percent level. Workers older than 65 years reported mistreatment less than workers in other age groups. Between those who reported being mistreated and those who did not, we did not observe any statistically significant differences across race, education, income, and citizenship, although the descriptive statistics suggested that mistreated workers predominantly possess some college experience and belonged to the middle income group.

The lower the mean scores for physical health items and the higher the mean scores for mental health items, the better the perceived health status. Individuals who reported workplace mistreatment had higher mean scores for physical health (except for vision) and lower mean scores for mental health than those who did not report having been mistreated, suggesting poorer perceived physical and mental wellbeing among the those who reported mistreatment.

Among those who reported having been mistreated, 11% perceived that their health had deteriorated, compared to 5% of workers who did not report mistreatment.

Table 3. Association between HRQL components and workplace mistreatment: Ordered logistic regression results in terms of odds ratio (OR)[§].

Health Status	Mistreated (OR)	95% CI
Sadness	1.9 **	1.54, 2.39
Nervous	1.96 **	1.60, 2.42
Restless	1.4 **	1.14, 1.73
Hopeless	2 **	1.53, 2.60
Effort	1.8 **	1.50, 2.30
Worthless	1.9 **	1.50, 2.60
Socializing	1.8 **	1.26, 2.75
Limitation mental	4.3 ***	1.60, 11.00
Limitation physical	1.6 *	1.10, 2.40
Sleep Hours	0.8	0.70, 0.98
Hyper-tension	1.09	0.83, 1.42
Diabetes	1.28	0.83, 1.98
Vision problems	0.73	0.51, 1.00
Hearing problem	1.07	0.86, 1.32
Problem walking	1.40	1.00, 1.96
Problem climbing	1.23	0.81,1.86
Problem reaching	1.81 **	1.23, 2.60
Problem grasping	1.27	0.83, 1.95
Problem carrying	1.49	0.97, 2.29
Annual health improvement	0.77 *	0.61, 0.96

* Significant at 10% level, **significant at 5% level and *** significant at 1% level

[§]Note that separate ordered logistic regressions were run for each health indicator including all covariates shown in Table 1.

Individuals who had not been mistreated reported better health status than those who had been mistreated. Regression results show that workers who reported workplace mistreatment were twice as likely to report mental health problems when compared to their non-bullied colleagues, evident from the statistically significant (at 95% CI) odds ratios reported for mental and emotional health measures. Workers who have experienced workplace mistreatment were less energetic, more exhausted, and felt everything was an effort (OR=1.8). Exposures to workplace mistreatment nearly doubled the odds of feeling sadness (OR=1.8), nervousness (OR=1.96), hopelessness (OR=2), and worthless (OR=1.9).

Little association was observed between reports of workplace mistreatment and impairments in vision, hearing, and physical health conditions. Mistreated workers were at higher odds of experiencing problems in daily activities such as walking (OR=1.4), climbing (OR=1.2), reaching for objects (OR=1.8), grasping (OR=1.3), and carrying moderately heavy objects (OR=1.5). However, except for reaching for objects (OR=1.8), none of the associations were statistically significant.

Finally, following the scoring algorithm of SF-20, we calculated the scores for individual health items and found that the average scores are lower for workers who reported workplace mistreatment, and the differences were statistically significant across the mental health dimensions (Table 4).The difference in total HRQL scores, i.e., scores summed over all the individual health components, between mistreated and non-mistreated workers is shown in Table 5. The mean estimated HRQL score for the study population was 86.5. The mean HRQL score for non-mistreated workers was 87.1 while the score for those who were mistreated was 77.7. The difference was 9.4 and is statistically significant at the 95% confidence level. Furthermore, assuming HRQL=100 as perfect health status, mistreated and non-mistreated workers have 22.3 and 12.9 deficits from perfect health, showing that mistreated workers have a 72% greater health deficit .

In spite of mistreatment being insignificantly associated with physical health conditions, the strong association between mental health and workplace mistreatment was enough to create a statistically significant gap in HRQL estimates for mistreated and non-mistreated workers.

DISCUSSION

The negative association between workplace mistreatment and mental and emotional health was evident from the highly significant statistical relationships between reports of mistreatment and emotional and mental health. The workplace mistreatment over previous 12 months was negatively associated with emotional wellbeing during the month prior to the survey. Whether these perceived negative emotions could be solely attributed to workplace mistreatment was not clear. The NHIS items asked respondents about their mental and emotional health status over the previous 30 days, while the workplace mistreatment question asked about occurrence of mistreatment over the previous 12 months. Since the data did not provide the exact date of mistreatment, it cannot be determined whether mistreatment occurred before the immediate 30 days period for which the emotions were reported. While negative emotions could be a contributing factor for reporting being mistreated [28-29], research mostly suggests that mental and emotional distress could also be a result of the workplace mistreatment [10-15]. However, without further details on time and dates of occurrences of mistreatment, reduced emotional wellbeing could not be solely attributed to workplace mistreatment.

Table 4. Mean Scores for HRQL items for two groups. Scores can vary from 0 – 100 with 100 is perfect health and 0 is death.

HRQL Items	Overall Study Population	Non-Mistreated Workers	Mistreated Workers	Difference (Non-mistreated – Mistreated)
Vision	71.5	71.7	68.6	3.1
Hearing	84.2	84.5	80.7	3.8
Walking	95.8	96.1	92.4	3.7
Climbing	97.3	97.6	94.5	3.1
Reaching	98	98.3	95.4	2.9
Grasping	98.2	98.4	96.3	2.1
Carrying	97.8	98.1	95	3.1
Physical role limitation	97.2	97.5	94.1	3.4
Emotional role limitation	91	92	82	10
Sadness	91.2	91.9	82.8	9.1
Nervousness	86.1	87	75.4	11.6
Restless	85.4	86.3	74	12.3
Hopeless	95.6	96	89.4	6.6
Everything seems effort	85	86	72	14
Worthless	97	97.1	91	6.1
Experience joint pain	71	72	53	19
Social interaction	97.6	98	90	8
Overall health	73.2	74	67.1	6.9
Health Improvement	83	84	75.3	8.7
Sleep	67	67	54	12.7

Table 5. Comparing HRQL scores between mistreated and non-mistreated workers

HRQL	Mean Scores	SE	95% CI
Total	86.5	0.07	86.34-86.62
Non-mistreated	87.1	0.07	86.9-87.2
Mistreated	77.75	0.35	77.56-77.92
Difference	9.4	0.25	9.3-10.3

The results show that workplace mistreatment is negatively associated with HRQL and that workers reporting mistreatment experienced poor health conditions. Also, mistreated workers had significantly higher work limitations due to emotional and mental health. Work limitations triggered by negative mental health in the preceding 30 days increased by four folds (OR=4.3) for the workers who reported having been mistreated. This hints that mistreated workers might have had higher presenteeism compared to their non-mistreated colleagues.

Results also showed a statistically significant association between workplace mistreatment and difficulty in participating in social activities (OR=1.78). Without establishment of a causal relationship, we do not know if mistreatment directly impaired social functioning. It is possible that negative mental/emotional health due to mistreatment impaired social functioning indirectly. It might also be possible that workers suffering from physical health problems had limited scope of social interaction. Since we controlled for overall physical health status, the reported odds ratio showed the association of bullying with adversity of social activity after controlling for physical health concerns.

Another variable of interest was the improvement in health over the past year. While revealing their perceived change in health status since last year, workers have already taken into account the mistreatment. The probability of mistreated workers reporting a health decline over the past year was over twice as great (11% vs. 5%) as that of non-mistreated workers (Table 1). The result presented in Table 3 also showed that for mistreated workers, the odds of perceiving an improvement in health was 0.77 times lower than the odds for non-mistreated workers, given that all the covariates are held constant (OR =0.77: 95% CI: 0.61, 0.96).

The lack of an association between workplace mistreatment and negative physical health may be because the effects of emotional traumas such as mistreatment on mobility and other physical health conditions are not well defined. Mental and emotional stress caused by workplace mistreatment could trigger

physical health problems in the long run [3]. If such linkages exist, studying them requires time series analysis over a considerable period of time. Also, workplace mistreatment may occur as a result of physical functional limitations of targets of mistreatment. A non-significant association suggests that physical functioning was unlikely a determinant of workplace mistreatment.

A limitation of this study is that the time frames considered in the NHIS questions did not provide the scope of establishing a cause-effect relationship. For example, while the independent variable was based on having been mistreated during the 12 months prior to the survey, the emotional and physical health items were based on perception during the 30 days prior to the survey. This non overlapping nature might not capture the immediate effect of workplace mistreatment on wellbeing measures such as HRQL.

CONCLUSION

Literature has shown that workplace mistreatment such as bullying or harassment affects health, especially mental health [8-17]. However, there is a dearth of such studies at the national level in the context of US workers. Our analysis of the NHIS data enhances the scope of such research by reiterating the association between workplace mistreatment and health status of those who reported having been mistreated at work. This is one of the first studies that illustrate the association of perceived workplace mistreatment in terms of bullying or harassment and overall HRQL.

The analysis showed that report of workplace mistreatment was associated with perceived negative emotional health and difficulties in social functioning. Workplace mistreatment was negatively associated with perceived health improvement.

As mentioned earlier, this is one of the few studies in the US that looked at overall health and wellbeing associated with workplace mistreatment and measures the HRQL related to mistreatment using national level data. The estimates are based on a generic HRQL instrument adjusted to fit the needs of the current study. Development of a HRQL tool/instrument specifically targeting workplace bullying will be of significant progress in this area of research. Future work could examine more in depth specific HRQL measures related to emotional and mental health, standardize time periods of reference for survey questions, and develop a longitudinal study protocol.

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