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Work Stress and Health Outcomes among Ready-Made Garment Workers in Dhaka, Bangladesh

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Bangladesh is one of the leading exporters of ready-made garments worldwide producing at very low cost almost exclusively for Western markets. Western media have increasingly featured the adverse working conditions in Asian ready-made garment factories. Empirical evidence, however, on psychologically adverse working conditions, i.e. “work stress”, and their association with health in the ready-made garment setting remains sparse. Further, work stress has been identified as a risk factor for adverse health outcomes. Amongst others, glucocorticoids may represent a mediator of these associations. Evidence on the association of work stress with glucocorticoid levels is inconsistent and mostly stems from Western countries, with limited generalizability to other regions of the world. These inconsistencies may partly be due to methodological limitations associated with the measurement of long-term cortisol secretion in saliva, serum or urine. Therefore, the present study set out to explore work stress components and their associations with self-reported health outcomes and glucocorticoid concentrations as measured in hair among 514 employees in an export oriented ready-made garment factory in Dhaka, Bangladesh.

Drawing on insights from previous ethnographic research, the cross-sectional epidemiological study was conducted in February and March 2012. To measure work stress a 7-item version of the Effort-Reward-Imbalance model was combined with seven setting- and culture-specific items derived from previous ethnographic research. Health outcomes included self-rated health and seven common physical symptoms. The work stress interview was psychometrically evaluated by exploratory factor analysis and Cronbach’s alpha to assess internal consistency. Multivariate logistic regression was used to estimate odds ratios for associations between work stress components and health outcomes, which also serves the purpose, in work stress research, to assess criterion validity of work stress interviews. The exploratory factor analysis suggested three factors which were labeled *work-related demands*, *interpersonal resources* and *work-related values*. *Work-related demands* consisted of four items on physical demands, time pressure, worries about mistakes and exposure to abusive language. *Interpersonal resources* comprised five items on support, recognition, adequate payment, workers’ trust in the management, and the management’s trust in workers, as perceived by the workers. *Work-related values* captured job security, promotion prospects and decision latitude by three items. Cronbach’s alpha coefficients for these three scales were 0.59, 0.55, and 0.42, respectively. *Work-related demands* and *interpersonal resources* were significantly and positively associated with most health outcomes (odds ratios ranged from 1.26 to 1.83). *Work-related values*, however, were not associated with any self-reported health outcome.

Cortisol and cortisone concentrations in hair were analyzed by liquid chromatography-mass spectrometry. Stepwise multivariable linear regression models (backward elimination of predictors) were used to estimate associations of hair cortisol concentrations and hair cortisone concentrations with the three work stress components. For significant work stress component(s), further multivariable linear regression analyses were conducted to explore whether, and if so, which individual item(s) contributed most. Mean hair cortisol concentrations equaled 3.27 (standard deviation 2.58) pg/mg with a range from 0.53 to 18.60 pg/mg. Hair cortisone concentrations (mean 25.79, (standard deviation 12.85) pg/mg), ranged from 0.26 to 87.45 pg/mg. Hair cortisol concentrations were found to be significantly associated with *work-related values* (beta=0.209, p=0.021). Additional analyses of the three *work-related values* items revealed that this association was largely driven by the item on

promotion prospects implying that the perception of *good* promotion prospects was associated with *higher* hair cortisol concentrations.

High *work-related demands* and poor *interpersonal resources* represented key components of work stress and were important determinants of poor health. The key work stress components observed in this study partly differed from those identified in Western work place settings. The finding of elevated hair cortisol concentrations with good promotion prospects may initially seem counter-intuitive. However, it is supported by research documenting that actual promotion may result in poorer mental wellbeing. Moreover, being promoted in the Bangladeshi ready-made garment industry may possibly represent a stressful experience: Job promotions are rare in this setting and are associated with the need to meet exceptional job-related demands.

These findings could offer starting points for interventions to improve the health of workers in Bangladeshi ready-made garment factories. Further research from ethnic and culturally diverse occupational settings is needed to shed light on the reproducibility of the findings and to improve the understanding of psychobiological implications of psychosocial working conditions across cultures and contexts.