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A SYSTEMATIC REVIEW ON MEASUREMENT TECHNIQUES OF WORKERS' EXPOSURE TO NANOMATERIALS IN LOW- AND MIDDLE- INCOME COUNTRIES

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Introduction Nanotechnology expresses great potential as enabling technology but there are still uncertainties about the health risks for workers potentially exposed to nano-objects and their agglomerates and aggregates (NOAA). Different methodological approaches to measure airborne NOAA in the workplace have been proposed. This study finalised a systematic review on this theme with the aim to identify techniques of exposure measurement to be recommended even in contexts with low resources, such as Low- and Middle- Income (LMI) countries.

Materials and methods We collected scientific papers reporting techniques of NOAA exposure measurements in the workplace and we summarised the data for each eligible technique according to PRISMA guidelines; then we rated the quality of evidence following an adapted GRADE approach.

Results We found 69 eligible studies to be included in qualitative synthesis: the majority of studies reported a moderate quality and only 2 studies demonstrated the use of a high quality exposure measurement technique. The review demonstrates that a basic exposure measurement, i.e. evidence for the presence or absence of NOAA in the workplace air, can be achieved with moderate (40 techniques) to high quality (2 techniques); 13 of these techniques are defined as comprehensive, since they allow also the quantification of NOAA in the workplace.

Conclusions This systematic review allowed identifying criteria for a reliable measurement of exposure to NOAA to be recommended in LMI countries. The findings of the study defined a list of requirements that must be fulfilled by an effective measurement technique (either basic or comprehensive), and highlighted the main weaknesses that need to be tackled for an effective affordability evaluation.

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OCCUPATIONAL NOISE INDUCED HEARING LOSS AMONG TANZANIAN METAL INDUSTRY WORKERS

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Introduction Noise induced hearing loss (NIHL) is a preventable disease. However, the global burden of NIHL is increasing; especially in developing countries. The prevalence of NIHL among metal industry workers in Sub Saharan countries including Tanzania is not well documented.

Methods This study was conducted among male metal industry workers (Exposed, n=226) and Public Primary School teachers (Controls, n=110) between June 2016 and June 2017, in Dar

es Salaam. The exposed were from four metal industries (Factory A, n=65; B, n=45; C, n=53; D, n=63). Hearing thresholds at 0.5, 1, 2, 3, 4, 6 and 8 KHz were examined using Interacoustic AD 226 audiometer. NIHL was defined as hearing threshold levels >25 dB in either ear at 3, 4 and 6 KHz. The WHO classification of hearing loss was used.

Results The prevalence of NIHL among exposed was 50% and 47% in the right and left ear, respectively. The highest prevalence was found in factory B (71% and 62%), followed by D (48% and 54%), A (48% and 48%), and the lowest in factory C (37% and 25%) in the right and left ear, respectively. The proportion of mild, moderate and severe NIHL in the right and left ear was 80% and 79%, 20% and 18%, 0% and 2%, respectively.

Among controls, the prevalence of NIHL was 31% and 28% in the right and left ear, respectively. The proportion of mild, moderate, severe NIHL in the right and left ear was 86% and 76, 11% and 15%, 3% and 0%, respectively. Nine percent of the controls had profound NIHL in the left ear and none among exposed.

Discussion We found high prevalence of NIHL among Tanzanian metal industry workers. Further studies on noise exposure and the determinants for reduced hearing are needed. Establishment of a hearing conservation program in the metal industries seems to be important.

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WORKPLACE EXPOSURE PROBLEMS DETERMINED IN CLEANING PROFESSIONALS WORKING IN IZMIR, ANTALYA AND BURSA PUBLIC HEALTH DIRECTORIES

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Introduction Physical, chemical and biological risk factors exist in workplaces of cleaning professionals. These risk factors at work may cause respiratory, skin, and musculoskeletal health problems for these workers. The prevalence of these health problems caused by occupational risk factors such as exposure to chemicals in cleaning products and physical strain in the workplace of cleaning professionals are not yet fully known in Turkey.

For this reason, the objective was to assess the extent of workplace exposure to occupational risk factors for cleaning professionals of Izmir, Antalya and Bursa Public Health Directorates (including subcontractors).

Methods We plan a cross sectional study using a questionnaire on socio-demographic characteristics, risk factors at work, work history, health history, health status, exposures, European Community Respiratory Health Survey II (ECHRS II) questionnaire, Nordic Occupational Skin Questionnaire and the Nordic Musculoskeletal Questionnaire using a face-to-face interview method. The interviews will be performed by trained occupational health and safety specialists from the Public Health Directorates of Izmir, Antalya and Bursa Turkey.