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Week of 24 April 2026

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The hidden hazards of clay: a qualitative exploration of silica exposure and well-being in ceramic art studios

International journal of qualitative studies on health and well-being 2026 Dec 31;21(1):2661147 · 31 Dec 2026

PURPOSE: This study examines how Ghanaian ceramic artists and students perceive and respond to crystalline silica exposure in studio environments, situated within Ghana's ceramic traditions where safety infrastructure and occupational health regulation remain uneven, and how these experiences influence health awareness and artistic identity in creative practice.

METHODOLOGY: A qualitative interpretive phenomenological design was employed, using in-depth interviews with fifty Ghanaian ceramic artists and students with at least one year of active studio practice and exposure to clay-processing. Participants were selected regardless of respiratory symptoms to capture lived experiences. Participant observation was conducted in selected studios, and thematic analysis was applied to narratives to explore meaning-making and changing perceptions of silica-related health risks.

RESULTS: Findings identified a process through which artists integrate health awareness into their artistic identity, moving from initial disbelief about clay-related danger to increased bodily awareness, fear, and negotiating of normalized studio risk. Participants reported persistent chronic cough, chest tightness, and breathing difficulties associated with prolonged dust exposure, generating anxiety and behavioral adaptations.

CONCLUSIONS: Silica exposure is a cultural, educational, and institutional issue, requiring integrated health education, improved studio design, strengthened safety communication, and embedded occupational health practices to sustain long-term creative practice.

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Assessing gallium arsenide health risk: critical insights for protecting workers and the environment

Environment international 2026 Apr 12:211:110253 · 12 Apr 2026

Gallium arsenide (GaAs), a critical material in the rapidly expanding semiconductor industry, potentially poses a growing occupational and environmental health concern. Current occupational exposure limits (OELs) for GaAs are largely based on inorganic arsenic regulations, which fail to account for the unique toxicological profile and potential synergistic effects of its components. This study provides a rigorous human health risk assessment to inform decision-makers on the re-evaluation of existing regulatory standards. Benchmark dose modeling two-year inhalation study

data from the United States National Toxicology Program identified chronic-active lung inflammation in male rats as the critical endpoint. We calculated a benchmark concentration lower 95% limit (BMCL5) of 8.0×10^{-4} mg GaAs/m³. Applying the Regional Deposited Dose Ratio model and an additional uncertainty factor of 30 for species extrapolation yielded a reference concentration of 1.71×10^{-5} mg GaAs/m³ and a recommended exposure limit of 1.26×10^{-4} mg GaAs/m³. A risk assessment using personal sampling data for exposed engineers, operators, and administrative staff found the minimum mean hazard quotient to be 61, dramatically exceeding the acceptable level of 1. These results demonstrate a substantial health risk under current occupational conditions, emphasizing the inadequacy of the existing OEL of 0.01 mg GaAs/m³. This study highlights an urgent need to revise occupational and environmental GaAs exposure guidelines to protect both workers and residents in this critical and rapidly growing industry.

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Exploring chronotype, sleep patterns, and health in petrochemical shift workers

Atencion primaria 2026 Apr 17;58(7):103480 · 17 Apr 2026

DESIGN: This was a cross-sectional study. **SITE:** The study was conducted in a petrochemical complex located in southern Iran.

PARTICIPANTS: 250 male shift workers with at least five years of shift work experience, no major physical or mental health issues, and no use of alcohol, drugs, or sleep medications.

INTERVENTIONS: No interventions were applied, as this was an observational cross-sectional study.

MAIN MEASUREMENTS: Data were collected using the Shift Work Impact on Health and Social Disorders (SOS) Questionnaire, the Pittsburgh Sleep Quality Index (PSQI), the Morningness-Eveningness Questionnaire (MEQ), and the Cognitive Failure Questionnaire.

RESULTS: The prevalence of musculoskeletal, gastrointestinal, and cardiovascular disorders was significantly higher in morning types than evening types ($p < 0.05$). Cognitive failures and sleep quality also differed significantly between the two groups ($p < 0.05$).

CONCLUSIONS: Evening-type individuals showed higher adaptability to shift work and lower vulnerability to negative consequences. Circadian typology should be considered when assigning workers to shifts, especially for sensitive jobs.

OBJETIVO: El cronotipo es una característica personal que afecta la adaptabilidad de un individuo al trabajo por turnos. El presente estudio tuvo como objetivo investigar la relación entre el cronotipo, los trastornos de salud relacionados con el trabajo por turnos y la calidad del sueño en trabajadores por turnos de la industria petroquímica en el sur de Irán.

DISEÑO: Estudio transversal.

EMPLAZAMIENTO: El estudio se llevó a cabo en un complejo petroquímico ubicado en el sur de Irán.

PARTICIPANTES: 250 trabajadores varones por turnos con al menos cinco años de experiencia en turnos, sin problemas graves de salud física o mental y sin consumo de alcohol, drogas ni medicamentos para dormir.

INTERVENCIONES: No se aplicaron intervenciones, ya que se trató de un estudio observacional transversal.

MEDICIONES PRINCIPALES: Los datos se recopilaron mediante el Cuestionario de Impacto del Trabajo por Turnos en la Salud y Trastornos Sociales (SOS), el Índice de Calidad de Sueño de Pittsburgh (PSQI), el Cuestionario de Matutinidad-Vespertinidad (MEQ) y el Cuestionario de Fallos Cognitivos.

RESULTADOS: La prevalencia de trastornos musculoesqueléticos, gastrointestinales y cardiovasculares fue significativamente mayor en los tipos matutinos que en los vespertinos ($p < 0,05$). Los fallos cognitivos y la calidad del sueño también difirieron significativamente entre ambos grupos ($p < 0,05$).

CONCLUSIONES: Los individuos de tipo vespertino mostraron una mayor capacidad de adaptación al trabajo por turnos y una menor vulnerabilidad a las consecuencias negativas. Se sugiere considerar la tipología circadiana al asignar trabajadores a turnos, especialmente para trabajos más sensibles.

OBJECTIVE: Chronotype is a personal characteristic affecting an individual's adaptability to shift work. The present study aimed to investigate the relationship between chronotype, shift work-related health disorders and sleep quality in shift workers in the petrochemical industry in southern Iran.

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CHEMICAL EFFECTS

Population-specific metabolic pathways shape neurotoxicity: Evidence from human biomonitoring of neonicotinoid insecticides and their metabolites in South China

Environmental pollution (Barking, Essex : 1987) 2026 Apr 16:399:128156 · 16 Apr 2026

Neonicotinoid insecticides are readily metabolized in humans; however, current human biomonitoring research has mainly focused on the parent compounds, with limited information of their metabolites. Investigating the metabolic characteristics of neonicotinoids across different human populations can help reduce uncertainty in health risk assessment and identify vulnerable individuals. In the present study, we analyzed six neonicotinoids and their seven metabolites in urine samples from 82 children and adults from Guangdong, South China. Total urinary residues of neonicotinoids were dominated by the metabolites. While neonicotinoid exposure was higher in children in general, greater concentration of nitenpyram was detected in adults. The concentrations of the reduced metabolites of thiacloprid (thiacloprid-amide) (children 2.44 ± 2.66 vs. adults 0.68 ± 0.75 ng/mL) and imidacloprid (imidacloprid-guanidine) (12.0 ± 14.2 vs. 5.01 ± 9.98 ng/mL) were significantly elevated in children. Examination of the metabolic pathways of imidacloprid revealed that boys were more likely than girls to transform imidacloprid to imidacloprid-guanidine ($p < 0.05$), yet no such gender difference was observed in adults. Owing to these distinct metabolic pathways, at the equivalent imidacloprid exposure dose, neurotoxicity toxic unit in boys was 16.0% higher than in girls and 81.2% higher than in adults, while this value in girls was 56.2% higher than in adults. In addition, neither molecular docking nor cellular assays showed estrogenic or anti-estrogenic effects of imidacloprid or its metabolites while neonicotinoids are considered endocrine

disruption chemicals in previous studies. Collectively, the present study highlights the importance of considering population-specific differences in neonicotinoid metabolic pathways for more accurate health risk assessment and identification of vulnerable populations.

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Prenatal exposure to 33 endocrine-disrupting chemicals and pubertal development at age 9 in Spain

Environmental research 2026 Apr 16 · 16 Apr 2026

Puberty relies on a hormone-regulated cascade of events initiated in fetal life and might be disrupted by exposure to endocrine-disrupting chemicals (EDCs), with alterations manifesting during pubertal development. However, studies addressing prenatal exposure to multiple EDCs remain scarce. This study explores the associations between prenatal exposure to 33 EDCs and early sex maturation in 386 Spanish mother-child pairs (girls: 49%; recruitment: 2003-2005). We measured seven organochlorine compounds (OCs) and four perfluoroalkyl substances (PFAS) in maternal blood, and seven phenols and 15 phthalates in maternal urine. Pubertal development was assessed at age 9 using Tanner staging for genital development (GD), breast development (BD), and pubic hair development (PH) alongside salivary sex hormones. Sex-specific analyses included single-chemical (robust Poisson/linear regression) and mixture (principal components /Bayesian kernel machine regression) analyses. In single-chemical models, higher prenatal p,p'-DDE and p,p'-DDT concentrations were associated with delayed BD and GD, respectively, while PCB-180 and parabens (ETPA, BUPA) were associated with earlier BD, and phthalates with earlier PH (girls: MEHP, MEHHP, MEOHP, MECPP; boys: MEP, MnBP). For sex hormones, β -HCH (both sexes), p,p'-DDE, PCB-180, PFOS (boys), and p,p'-DDT, OH-MPHP (girls) were positively associated with testosterone, and HCB was positively associated with estradiol (boys). Conversely, BUPA, OH-MPHP (boys), and BPA (girls) were negatively associated with testosterone. In mixture models, the first component of OCs was positively associated with male testosterone, but the results of other mixture analyses were unclear. Overall, prenatal exposure to some EDCs may impair fetal programming of puberty, yet the impact of chemical mixtures remains uncertain.

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Association Between Tobacco Smoke Exposure and Cadmium Biomarkers in the US Population: NHANES 2015-2020

Biological trace element research 2026 Apr 18 · 18 Apr 2026

Cigarette smoke contains toxic chemicals, such as cadmium (Cd), which accumulate in the body and cause severe health issues. This study examined associations between tobacco smoke exposure on Cd biomarker levels in the US population. A cross-sectional study was conducted using data from the National Health and Nutrition Examination Survey (2015-2020) for children, adolescents, and adults in the US. The association between serum cotinine levels and blood and creatinine-adjusted urine Cd levels was investigated. Smoke exposure status was categorized by serum cotinine levels into no exposure, light secondhand exposure, heavy secondhand exposure, and active smoking. Survey-weighted multivariable linear regression was conducted to estimate geometric means (GMs) and ratios of GMs, adjusting for covariates. Among adults, compared to individuals with no exposure, those with cotinine concentrations corresponding to the range commonly interpreted as

heavy secondhand smoke exposure and active smoking had 1.55 times (95% CI: 1.30, 1.84) and 3.20 times (95% CI: 2.87, 3.57) higher blood Cd levels, respectively, with evidence of a dose-response relationship (p -trend < 0.001). However, for urinary Cd, active smokers showed significantly elevated levels (1.57 times; 95% CI: 1.45, 1.71), while no significant elevation was observed for secondhand smoke exposure. Among children and adolescents, Cd levels did not differ across smoke exposure statuses. Additionally, older age, female sex, lower poverty-income ratio, lower education, and racial minority status were associated with higher Cd exposure. These findings indicate that higher serum cotinine concentrations were associated with higher Cd biomarker levels among adults in the US population.

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ENVIRONMENTAL RESEARCH

Fugitive Dust in the Vicinity of Cement Storage Facilities as Localized Sources of Toxic Metal Exposure in Nigerian Urban Settings: A Geochemical Health Risk Assessment

Environmental toxicology and pharmacology 2026 Apr 16:124:105025 · 16 Apr 2026

This study quantified toxic metal concentrations in settled atmospheric dust in the vicinity of cement storage facilities and evaluated associated human health risks in selected Nigerian cities. Dust samples ($n = 75$) were collected from five active cement depots across Ondo State and Abuja and analyzed for 37 elements using inductively coupled plasma optical emission spectrometry. Human health risks for adults and children were assessed through ingestion, inhalation and dermal exposure pathways following United States Environmental Protection Agency models as a screening-level assessment. Lead concentrations were highest at Igodan Lisa, Okitipupa (726.5 mg/kg), approximately fourteen times higher than levels measured at the lowest site (Weye Police Station, Abuja). Total hazard indices exceeded the safe threshold of 1.0 by over two orders of magnitude for both adults (HI = 137.5) and children (HI = 58.9), indicating substantial non-carcinogenic risk. Inhalation exposure dominated overall risk, accounting for more than 99 % of the average daily dose for chromium, lead and nickel. Estimated cancer risk for children via chromium inhalation reached 5.1×10^{-3} , equivalent to one additional cancer case per two hundred exposed individuals and far above the acceptable benchmark of 1×10^{-6} . Principal component analysis suggested mixed industrial and crustal sources, although source attribution remains inferential due to the absence of airborne particulate matter measurements and mineralogical confirmation. These findings identify areas surrounding cement storage facilities as hyper-localized hotspots of toxic metal exposure, though conclusions are constrained by dry-season sampling and reliance on total rather than bioaccessible metal concentrations.

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Health Risk-Driven Prioritization of Organic Contaminants in Aquaculture Products From Eastern China: Integrating Exposure and Toxicity Data to Inform Regulatory Frameworks

Integrated environmental assessment and management 2026 Apr 17 · 17 Apr 2026

Eastern China is a densely populated region with clustered industrial and agricultural complexes that discharge organic pollutants. These contaminants accumulate in the environment and aquaculture products. Since the residents in Eastern China have a dietary preference for specific foods (e.g., aquaculture products), region-specific priority chemicals based on health issues, as well as region-specific regulations for aquaculture production, should be updated. Firstly, the prevalence of neurological disorders, particularly autism spectrum disorder (ASD), was identified in Eastern China through a systematic data mining. Then, a hybrid AHP-Entropy-TOPSIS model was applied to rank the chemicals (n = 14), which might be positively associated with neurodevelopmental disorders, such as polycyclic aromatic hydrocarbons (PAHs), bisphenol A (BPA), organophosphate pesticides (OPPs), pyrethroids (PYRs), etc. Five parameters, which are odds ratios of pollutant-neurological disorder associations, urine or blood concentrations, intake via aquaculture products, publication quantities, and half-lives of the chemicals, were incorporated. The TOPSIS scores of PAHs, OPPs, BPA, PAEs, and PYRs were higher, suggesting a considerable health risk from consuming the aquaculture products in Eastern China. Finally, dietary contribution analysis confirmed aquaculture products as a significant source for PYRs (27.2%) and PAEs (11%), followed by PAHs (6.5%), OPPs (2.5%), and BPA (0.28%) in humans. It is necessary to monitor and regulate the use and incidental input of PYRs and PAEs during the culture period, coupled with public dietary advice to minimize the health risks. Regarding PAHs and OPPs, other exposure pathways could not be ignored. For BPA, predominant exposure pathways should be identified and regulated in the future. In summary, this study provided a scientific basis to screen for risk pollutants in aquaculture products in Eastern China, as well as delivering risk management advice for aquaculture production.

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Addressing Community Concerns About Unregulated Organic Contaminants in Surface Water: Integrating Suspect and Non-targeted Chemical Analyses with Zebrafish Toxicity Testing and Computational Hazard Comparisons

Environmental pollution (Barking, Essex : 1987) 2026 Apr 15:399:128103 · 15 Apr 2026

Decades of industrial activity have designated the lower 10 miles of the Willamette River as a Superfund site since 2000, focusing remediation efforts on metals, dioxins, and polycyclic aromatic hydrocarbons. However, little attention has been given to assessing the variability of emerging contaminants in Portland Harbor. Following requests by the Portland Harbor Community Coalition (PHCC), this study ensured continuous community dialogue and identified six sampling sites to collect water grab samples over 6 months. Samples underwent liquid chromatography high-resolution mass spectrometry analysis, employing suspect and non-targeted analyses to detect emerging contaminants. No distinct differences were observed between sites within and outside the Superfund area, but downstream (Site 6) exhibited notable monthly variations, potentially influenced by its proximity to the Columbia River and a wastewater treatment plant. Temporal variability predominated, with few compounds detected frequently. In most samples, no biological effects were observed with high-throughput zebrafish assays. Combining community engagement, suspect screening, and toxicity testing presents a novel approach to prioritize contaminants for further assessment. These findings inform community groups and regulatory agencies about potential risks associated with emerging water contaminants.

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Bisphenol A exposure disrupts the circadian clock system and impairs glycolipid metabolic function in mice liver

Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association 2026 Apr 16:213:116100 · 16 Apr 2026

Bisphenol A (BPA) is a widely existing endocrine-disrupting chemical that poses potential threats to human and animal health, including inducing metabolic disorders. Although previous studies have reported the adverse effects of BPA on liver glucose and lipid metabolism, the underlying molecular mechanisms remain incompletely elucidated. This study systematically evaluated the effects of BPA exposure on liver glucose and lipid metabolism in mouse hepatocytes (AML12) and mouse models, and detected its association with circadian clock disruption. In vitro models, BPA exposure for 24 h significantly decreased the mRNA and protein expression levels of BMAL1 in AML12 cells, while significantly up-regulating the mRNA expression of Nr1d1 and Dbp. On the contrary, the expression of Nr1d1 and Dbp decreased significantly after 48 h of BPA exposure. It is worthy to note that both mRNA and protein levels of BMAL1 were significantly increased in forskolin synchronized AML12 cells. In addition, the genes related to glucose and lipid metabolism were also detected after BPA exposure. The results showed that BPA exposure significantly increased the expression of Cd36 and Glut2 in non-synchronized AML12 cells. Meanwhile, the elevation of Hmgcr expression and the reduction of Ppar α were detected in forskolin synchronized AML12 cells. In vivo models, the results showed that ICR mice exposed to BPA (50 μ g kg⁻¹) for 42 consecutive days exhibited impaired glucose tolerance, decreased insulin sensitivity, increased liver glycogen storage, and decreased liver triglyceride (TG) levels. Meanwhile, the mRNA expression of Nr1d1 was significantly increased in mouse liver after BPA exposure. In addition, the mRNA expression of two lipid metabolism-related genes (Srebp1c and Elovl6) was significantly decreased in mouse liver after BPA treatment, but the expression level of Cd36 was significantly increased. In conclusion, this study demonstrates that BPA exposure impairs the circadian clock system and glucose and lipid metabolism in AML12 cells and mouse liver, providing important evidence that BPA overload in the environment can lead to the incidence of metabolic disorders in mammals. This study highlights the potential regulatory role of circadian clock system in BPA induced mammalian liver metabolic disorders and suggests that BPA may pose more profound potential risks to human and animal health.

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