Two years’ exclusive use of liquefied petroleum gas (LPG) for cooking reduced household air pollution exposure among rural Bangladeshi women

Evana Akhtar¹ Shyfuddin Ahmed¹
Muhammad Ashique Haider Chowdhury¹ Shirmin Bintay Kader¹
Mohammad Hasan Shahriar¹ Md. Khaledul Hasan¹ Mahbubul Eunus²
Bilkis A Begum³ Habibul Ahsan⁴ Mohammed Yunus¹ Rubhana Raqib¹

¹icddr,b, Mohakhali, Bangladesh, ²U-Chicago Research Bangladesh, Mohakhali, Dhaka, Bangladesh,
³Atomic Energy Commission, Dhaka, Bangladesh, ⁴University of Chicago, Chicago, USA

The Global Health Network

Published on: Jun 16, 2023
DOI: https://doi.org/10.21428/3d48c34a.166575da
License: Creative Commons Attribution 4.0 International License (CC-BY 4.0)
Exposure to household air pollution (HAP) caused by incomplete combustion of biomass fuel (BMF) is a major public health problem affecting half of the world’s population. Chronic exposure to higher levels of various air pollutants including particulate matters 2.5 (PM2.5), carbon monoxide (CO), black carbon (BC) increases health burden in rural communities of low- and middle-income countries including Bangladesh. More than 75 percent households in rural Bangladesh still use solid fuels for cooking, causing indoor air pollution. The findings from field-based randomized controlled trials to evaluate the effect of interventions with clean fuel for cooking were mostly inconclusive due to difficulties with adoption of and adherence to alternative cooking stove discarding use BMF stove. Studies on personal air monitor assessment of household air pollution before and after clean fuel intervention are scarce for longer period.

In an open-labeled intervention trial in rural Bangladesh, 300 (200 in LPG intervention arm & 100 in control BMF arm) non-smoking women (aged 25-65 years) received adequate information through educational sessions in the courtyard about the benefits of using clean fuels and adverse effects of BMF. When agreed, women were enrolled in the study. Intervention participants were provided with cookstoves and free supply of LPG cylinders for two years and appropriate training on its use. Trained field workers visited the households regularly to monitor and promote the exclusive use of LPG by checking the log book of new cylinder receipt. Here we aimed to assess the levels of personal exposure to PM2.5, CO, and BC before and after intervention with exclusive LPG use for cooking purpose for two years among the study participants, personal exposure to PM2.5 and BC for 24-hours was measured using portable air sampler.

LPG was exclusively used for two years by 97.5% of study households which significantly decreased the exposure levels of PM2.5 and CO in study women.

Clear communication regarding benefits of new intervention through repeated interactions and their comprehension by the community are most important factors for successful intervention of new technology. The beneficial aspects of exclusive LPG use will provide scientific evidence-based advice to update policy framework.