SUMMARY AND CONCLUSION

Occupational heat stress is a major health issue with several potential negative health and well-being outcomes. The present study was designed to gain an insight into the heat stress and heat strain in various occupational sectors. Heat stress was evaluated using WBGT in various locations inside the workplaces and heat strain parameters such as core body temperature, heart rate, sweat rate, perfusion index and urine specific gravity were measured in workers from various occupational sectors in Tamil Nadu. The measured WBGT ranged between 26.9°C to 41.7°C with an average of 31.5°C during summer. In winter WBGT ranged between 22.9 °C to 40 °C with an average of 26.9°C. During summer more than 80% of the workers engaged in heavy work categories had higher threshold limit values (TLV) than the recommended TLV as per ACGIH guidelines. During winter around 50% of the workers engaged in heavy work categories had higher TLV than the recommended TLV as per ACGIH guidelines which reflected that these workers were under direct heat impacts which might affect the health in later stages of work causing increase in morbidity and mortality. Mapping done in steel industry had highlighted potential high risk places inside the steel industry. More than 50 % of workers were working near the high WBGT locations. The workers expressed that it was very difficult to work continuously in hot environment which also affected their mental health. The workers reported few health impacts like excessive sweating, excessive thirst, skin rashes
and fainting. The reported health impacts are more in informal sector when compared to formal sectors. More than 50% of the workers reported health impacts due to clothing. This study had demonstrated statistically significant increase in core body temperature, heart rate and perfusion index among workers after work in excessive heat stress conditions. This study had demonstrated statistically significant increase in core body temperature, heart rate among workers working in areas with high heat stress (WBGT > 29°C) when compared to areas with low heat stress (WBGT < 29°C). This study had demonstrated significant increase in sweat rate among workers during summer and in workers working in informal sector. There was increase in urine specific gravity among workers during summer when compared to winter in a subset of study population. The odds of developing health impacts (heat strain) among workers working in locations with WBGT values more than 29°C is 1.5 (OR 1.5; 95% CI 1.4-2.9) times higher when compared to workers working in locations having WBGT values less than 29°C. The odds of developing health impacts (heat strain) among workers with heavy work load is 1.2 (OR 1.2; 95% CI 1.1-2.5) times higher when compared to workers with light work load. The odds of developing health impacts (heat strain) among workers during summer is 1.3(OR 1.3; 95% CI 1.2-3.7) times higher when compared to winter. This study from south India has highlighted the health impacts to occupational heat stress in several occupational sectors and has provided recommendations to reduce heat stress and thereby reduce health impacts and improve productivity.