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Research Article

Enrollment of Schools Teachers in Heat Stress Management Plan Targeting Vulnerable Dubai Schooling Kids, an Exercise in Community Engament, Empowerment and Mobilization

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Abstract

Background: Dubai has well recognized hot and humid weather during the period of time extended from May up to October (6) months out of each the year. Which put the whole population at the risk of exposure to heat stress when they are practicing outdoor activities during their routine work at their workplaces every day (8hours/5 days a week) Furthermore the kids are the fragile segment of population borne to develop heat stress incidents if measures to avoid such exposure have not been put in place properly.

Objectives: To assess the capacity building module on heat stress among Dubai schools teachers**,** and to study assess the extent of trainees response to heat stress at their facilities

Methodology: Enrollment and follow up of trainees cohort from Dubai schools within capacity building module on heat stress management at workplace has been carried out on a total of (57) teacher and nurses working at Dubai private schools (physical education teachers and science teachers along with school nurses. Well-developed capacity building module has been prepared and accredited by School Health department and public health department including an approach to prevention and control, followed by practical demonstration and on life training sessions on steps of managements and levels of response. One full day training coverage along with initial written and verbal assessment and final written and verbal assessment based on scoring and scaling measurements. The training exercise has been standardized with the best practice training modules applied worldwide.

Results: The study reflected that about 50.8% of the total contributors to the heat stress capacity building module were schools teachers whom having direct supervision responsibilities with outdoor students activities, and 15% of the trainees were teachers of physical education , in total of 65% of the trainees were school teachers as shown by Figure 1. The study showed that about 22% of the enrollment in capacity building was other school staff including administrators and other schools operating staff, the grant total of the trainees were 87.8%. The study findings showed that about 7% of the total participant never limits outdoor activities to the coolest part of the day before capacity building program and 35.1% of the participants never carrying out a heat stress awareness program in your school, about 33.3% were un able to recognize and never seen a child with signs and symptoms of Heat stress in school. About 29.9% never received any training or awareness on heat stress, 5.3% never applied preventive measures/procedures against heat stress in their schools. 68.4% were in favour of giving cold soda drinks to prevent heat and 61.4% were in favour of giving hot tea/coffee to prevent heat stress. The study showed improvement in heat stress management score among the participant in relation to (when children are playing outside in hot and humid weather the recommended drink to give). (I would call 999 if I see the child's body is), (recognition of High air temperature is), (If a child gets unconscious while playing outside, immediately give) and (recognition of Signs of heat stress adequately).

Conclusion: heat exposure is presenting an increasing challenge to workers injuries and heat-related illnesses. Manual workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. The potential impacts of workplace heat exposure are to some extent underestimated due to the underreporting of heat illnesses and the lack of awareness that heat exposure can increase the risk of work-related injuries.

Recommendations: As Heat stress can be lethal and it is 100 per cent preventable using common sense, thus developing competent school based heath stress prevention and management capacity building module at schools facilities is very vital and highly and high returns initiative with affordable cost.

Keywords: (Heat Stress, capacity Building, schools, teachers, Dubai)

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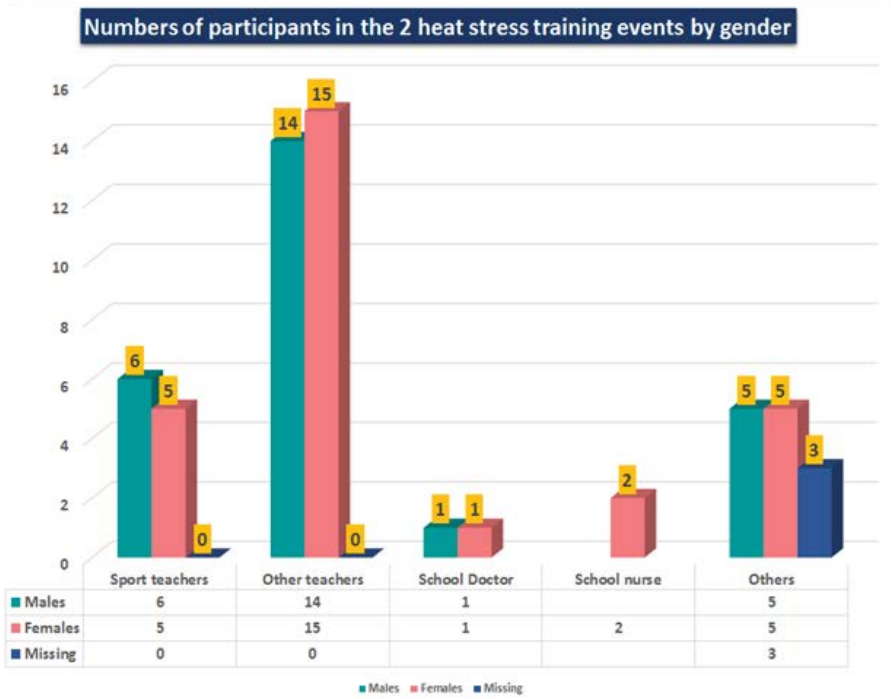

Figure 1: Trainee's distribution per gender, age and function

Introduction

Dubai has well recognized hot and humid weather during the period of time extended from May up to October (6) months out of the each year Which put the whole population at the risk of exposure to heat stress when they are practicing outdoor activities during their routine work at their workplaces every day, Furthermore the kids are most fragile segment of population borne to develop heat stress incidents if measures to avoid such exposure have not been put in place properly. Heat stroke occurs easily when temperatures and humidity are high, fluid intake is difficult, and there is no movement of air. For this reason, sports activities under the blazing sun and in closed gymnasiums require careful attention to the sports environment and sufficient fluid intake that also replaces lost salt. Furthermore, in the case that a patient presents with impaired consciousness, they should immediately be given emergency medical treatment with heat stroke, heart disease, and cranial nerve dysfunction in mind.

Extremely hot weather contributes to excess morbidity and mortality in the community [1]. Most of the extreme heat-related research has traditionally focused on vulnerable populations including the elderly, children and patients with chronic diseases and those on certain medications [2]. Extremely hot weather also places many types of indoor and outdoor manual workers at increasing risk of heat-related illnesses and injuries [3]. The incidence of heat-related illnesses in the UAE, where temperatures soar above 50 degrees Celsius in summer, are comparatively lower than countries experiencing a heat wave at 41 degrees Celsius or lower, said emergency medicine doctors [4]. There are multiple factors for the low incidence they said, including the predominantly indoor lifestyle with air-conditioning, gradual temperature changes that give the body time to acclimatize, and increased measures such as mid-day breaks to protect outdoor workers in the summer [5,6] has implications on learning outcomes since it has long been understood that an increase in the indoor temperature may lead to a decline in the productivity of students [7].The thermal conditions inside a building are determined by the interactions between the external climate and the building, the building shell and the internal space and the internal space and the occupants Accordingly, the parameters which influence the risk of overheating in buildings are:

- The external climatic conditions, i.e. the air temperature; solar radiation; rainfall; relative humidity and wind velocity [8].
- The microclimatic profile, i.e. the local scale climate which is affected by the surrounding surfaces (albedo, thermal capacity); topography; vegetation; soil structure and urban form (industrial processes, transportation, buildings, human metabolism) [9].
- The building shape and form, i.e. the geometric relations (envelope area to volume ratio, building height) which determine the building's exposure to solar radiation and the ambient air [10].
- The building fabric properties, i.e. the thermo-physical properties of its construction materials (U-values, g-values and albedo, thermal capacity).
- Internal gains, i.e. the sensible and latent heat emitted by human bodies, lighting, computing and office equipment, electric motors and appliances [11].

Objectives

To assess the capacity building module on heat stress among Dubai schools teachers**,** to study assess the extent of trainees response to heat stress at their facilities

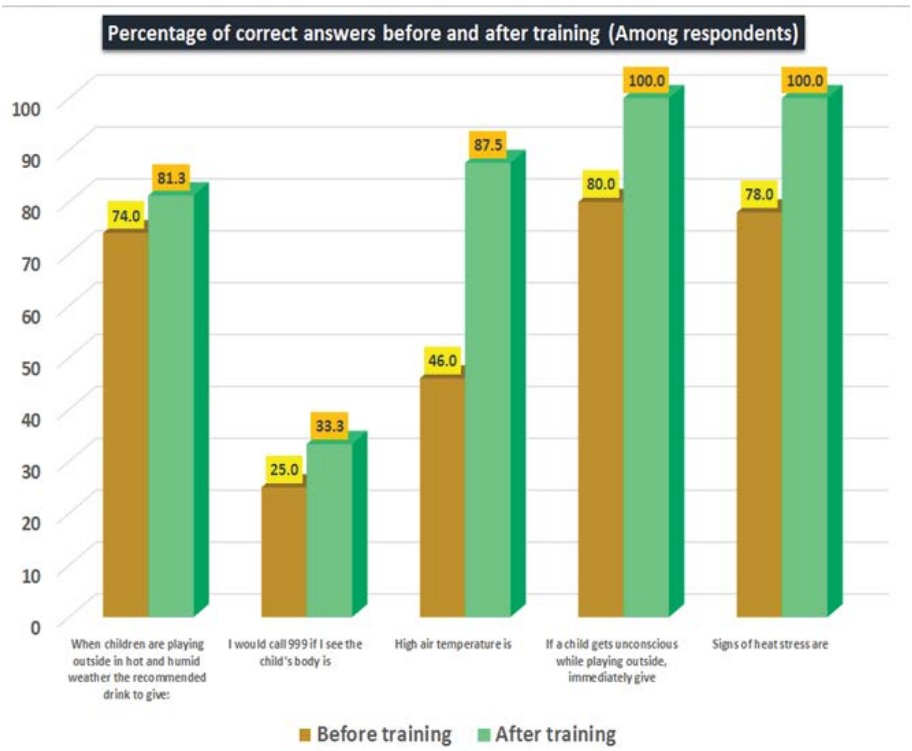

Figure 2: Improvement score of knowledge and response to heat stress among training enrolled groups.

Methodology

Enrollment and follow up of trainees cohort from Dubai schools within capacity building module on heat stress management at workplace has been carried out on a total of (57) teacher and nurses working at Dubai private schools physical education teachers and science teachers a long with school nurses. Well-developed capacity building module has been prepared and accredited by School Health department and public health department included theoretical part on heat stress and its related sequences in terms of mortalities and morbidities, as well as an approach to prevention and control, followed by practical demonstration and on life training sessions on steps of managements and levels of response. One full day training coverage along with initial written and verbal assessment and final written and verbal assessment based on scoring and scaling measurements. The training exercise has been standardized with the best practice training modules applied worldwide.

Results

The study reflected that about 50.8% of the total contributors to the heat stress capacity building module were schools teachers whom having direct supervision responsibilities with outdoor students activities, and 15% of the trainees were teachers of physical education, in total of 65% of the trainees were school teachers as shown by (Figure 2). The study showed that about 22% of the enrollment in capacity building was other school staff including administrators and other schools operating staff, the grant total of the trainees were 87.8%. The study findings showed that about 7% of the total participant never limits outdoor activities to the coolest part of the day before capacity building program and 35.1% of the participants never carrying out a heat stress awareness program in your school, about 33.3% were un able to recognize and never seen a child with signs and symptoms of Heat stress in school. About 29.9% never received any training or awareness on heat stress, 5.3% never applied preventive measures/procedures against heat stress in their schools. 68.4% they were in favour of giving cold soda drinks to prevent heat and 61.4% were in favour of giving hot tea/coffee to prevent heat stress as shown by Table 1. The study showed improvement in heat stress management score among the participant in relation to (when children are playing outside in hot and humid weather the recommended drink to give). (I would call 999 if I see the child's body is), (recognition of High air temperature is), (If a child gets unconscious while playing outside, immediately give) and (recognition of Signs of heat **str**ess adequately).

Discussions

The study showed that, enrollment of teachers in heat stress management plan at school atmosphere has significant impact on management outcomes in terms of effectiveness, cost, time and effort saving, this has been approved in similar studies carried out in Japan 2009, According to statistics compiled by the Japan Sport Council (NAASH), of the 133 cases of accidental death due to heat stroke that occurred in Japan under school supervision between 1975 and 2009, the largest number of cases (35) was related to baseball, followed by rugby, football, judo, kendo, mountaineering, and track and field, indicating that indoor sporting events also require cautions [12]. On June 13, 2003-a hot, humid day-a member of a junior high school sumo wrestling club in Akita Prefecture died of heat stroke during training at indoor facilities. In gymnasiums, where convection flow is small; especial

Questions	Percentage %		
	Always	Sometimes	Never
Do you promote regular intake of water especially during outdoor activities?	96.5	3.5	
Do you limit outdoor activities to the coolest part of the day?	42.1	49.1	7.0
Do you have shaded covered areas for children playing outdoors?	63.2	35.1	
Do you educate and inform children about sun protection and safety in the sun?	70.2	28.1	
Is there a heat stress awareness program in your school?	19.3	42.1	35.1
Have you seen a child with signs and symptoms of Heat stress in school?	8.8	56.1	33.3
Have you received any training or awareness on heat stress?	15.8	49.1	29.8
Are there preventive measures/procedures against heat stress in your school?	43.9	43.9	5.3
Do you offer breaks in between when children are playing outdoor?	80.7	14.0	
Are you in favour of giving cold soda drinks to prevent heat stress?	5.3	19.3	68.4
Are you in favour of giving hot tea/coffee to prevent heat stress?		5.3	61.4

Table 1: Knowledge status of trainees on health stress management at schools facilities in Dubai.

Correct response to heat stress statements by trainees	Before	After
When children are playing outside in hot and humid weather the recommended drink to give	74.0	81.3
I would call 999 if I see the child's body is	25.0	33.3
High air temperature is	46.0	87.5
If a child gets unconscious while playing outside, immediately give	80.0	100.0
Signs of heat stress are	78.0	100.0

Table 2: Score of trainee's assessment pre and post training sessions.

care needs to be taken with table tennis-which requires doors and windows to be closed-badminton, and kendo and fencing-which require players to wear protective gear that prevents their facial expressions from being seen clearly. Except for official matches, doors and windows need to be opened to enhance ventilation. For outdoor sporting events, too, training should be concentrated in the early mornings and evenings after dusk on days that are hot and humid with no breeze. Heat stroke occurs easily under conditions where temperatures and humidity are high, fluid intake is difficult, and there is no movement of air. Thus especial care needs to be taken with jogging under a blazing sun (baseball, football, etc), at that is what the teachers enrolled in this study already gained during training courses , activities on the ocean on sunny days with no wind (yachting), and sporting activities in closed gymnasiums (kendo, judo, table tennis, badminton, etc). When heat stroke is suspected, take action immediately if the person with suspected heat stroke is fully conscious, they should be given cold water to cool their body from within. In addition, they should be rested in a cool, well-ventilated place such as in the shade of a tree in the hope of generating insensible perspiration, spayed with water using an atomizer, etc., fanned, and thoroughly cooled until they begin to shiver. A characteristic of the human body is that it can endure low temperatures but not high temperatures. In order to send cool blood to the brain, which is the most important organ of the body, wet towels and ice packs, etc., should be placed against the person's head to cool the internal carotid arteries leading to the brain. Since, it is difficult for a person to drink if their level of consciousness is unstable, active treatment such as intravenous drips are necessary (Table 2). An ambulance must be called and the person transported to a medical institution. Resumption of exercise should take place after several days of rest to enable sufficient recovery and should commence with light exercise in a cool place, with the exercise load increased gradually. People who have experienced heat stroke are said to be susceptible to recurrences. Although heat stroke may be difficult to distinguish from other conditions, such as hyperventilation syndrome, in the case that a patient presents with impaired consciousness, they should be given emergency medical treatment as quickly as possible with heat stroke, heart disease (arrhythmia) [13-17].

The Current study revealed that the trainees enrolled came to recognize and utilized sufficient amounts of water, caffeine-less tea, sports drinks, towels, and mobile telephones should be brought to venues where sports are being played. For venues where a sport is played over a lengthy time period, use of devices such as heat stroke risk monitors and thermometers is recommended Consuming Fluids in Hot Environments If the body desires fluids, no limitations should be set. If 2% of body weight is lost (1 kg for a person weighing 50 kg), the person should be made to consume fluids, even if they resist. Except for official matches, doors and windows need to be opened to enhance ventilation. For outdoor sporting events, too, training should be concentrated in the early mornings and evenings after dusk on days that are hot and humid with no breeze. Heat stroke occurs easily under conditions where temperatures and humidity are high, fluid intake is difficult, and there is no movement of air. Thus especial care needs to be taken with jogging under a blazing sun (baseball, football, etc), activities on the ocean on sunny days with no wind (yachting), and sporting activities in closed gymnasiums (kendo, judo, table tennis, badminton, etc.).

Conclusion

Heat exposure is presenting an increasing challenge to workers injuries and heat-related illnesses. Manual workers who are exposed to extreme heat or work in hot environments may be at risk of heat stress. The potential impacts of workplace heat exposure are to some extent underestimated due to the underreporting of heat illnesses and the lack of awareness that heat exposure can increase the risk of work-related injuries.

Recommendations

As Heat stress can be lethal and it is 100 per cent preventable using common sense, thus developing competent school based heath stress prevention and management capacity building module at schools facilities is very vital and highly and high returns initiative with affordable cost. A module including enhancing knowledge, upgrading skills of teachers, investing in indoor activities at hot seasons, drinking cool and safe water could prevent people from being affected by heat stress.

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