OPEN PEER REVIEW

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Health Scope
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Peer Review Report for "The Effect of an Optimized Cooling Vest for Controlling the Women's Thermal Strain in the Hot Laboratory Conditions"

Author(s): Hakimeh Pourghayoomi, Habibollah Dehghan, Mohammad Javad Tarrahi

Review Timeline:

Submit Date: 1 Jun 2019
Revised Date: 14 Jan 2020
Accepted Date: 7 Apr 2020

Revision (0)

Here, you can see the **Reviewers**, **Associate Editors** and **EICs'** comments from the beginning to the end of the revision process.

REFEREE: Reviewer | Revision (0)

3 Sep 2019

Dear AE,
The manuscript is fairly well structured and well written. However, several issues have to be revised by the author/s before being ready for publication.
1- In the introduction section what do the authors mean by such numbers and figures?!! (According to the report by Statistical Center of Iran in 2015, the number of employed women is 228,789,839 people in the agricultural sector, 238,823,704 in the industrial sector, and 5,341,846,966 in the service sector [15].)
2- Please correct these "strongly disagreed", "disagreed", "normal", "agreed",/ there is nothing as the word 'agreed' in English!
3- The authors should provide more explanation about the word 'pack' in the manuscript.
4- The authors have only had women in the age range of 24-25 years old as the subjects of their study. Therefore no specific information about the older subject who might be present in several workplaces is presented in this study.
5- The discussion is short and does not consider a group of other studies which have been

conducted in this field. It is strongly recommended that the authors add more comparisons by considering several other references.
Thanks

REFEREE: Reviewer | **Revision** (0) 18 Dec 2019

Dear AE,
The manuscript entitle "Evaluation of the effect of an optimized cooling vest for controlling the women's thermal strain in the hot laboratory conditions".
This manuscript proposed a novel and an optimized cooling vest for controlling the women's thermal strain in the hot laboratory conditions. The manuscript was interest and appropriate to publish in the Health scope journal with moderate revision as follows:
Introduction: It is well structured.
Method:
2. The inclusion and exclusion criteria, and ethical issues considered for the participants of Step 1 should be mentioned.
3. Explain the strategy of the laboratory conditions considered at both stages (based on previous studies or other ...)
4. Further explanation is required in Figure 1 (a:… b:…., c…..)
5. It is suggested that the subtitle “Method” be changed to “Study design” (page 4, step 2)
Results:
1. The results of Demographic characteristics of both studied sample should be mentioned separately.
3. The results of the first step need to be described in the Results part.
4. Please add P-values to the Table 1.
Discussion:
1. It is suggested that the results of this study be compared and interpreted with a similar study among men
2. The limitations of the study need to be mentioned.
Thanks.

REFEREE: Associate Editor | **Revision** (0) 23 Dec 2019

Dear EIC,
The manuscript is studied, and there are some comments which should be addressed by the author. According to the comments, the document needs major revision.
Kind regards,

Ramazan Mirzaei: EIC | **Revision** (0) 24 Dec 2019

Dear Author,
The reviewers' comments are mentioned. Please correct the details as mentioned above carefully according to reviewers' request.
Thanks.

OPEN PEER REVIEW

Revision (1)

Reply to Reviewers

Ideally, the reviewing process can significantly improve the submitted manuscripts by allowing the authors to take into account the advice of reviewers. Author(s) must reply to all reviewers' comments in a separate Word file, point by point. A "**Reply to Reviewers**" document is submitted along with revised manuscript during submission of revised files, summarizing the changes that the authors made in response to the reviewers' comments. The responses to reviewers' comments specifies how the authors addressed each comment the reviewers made.

You can read the authors' responses to the reviewers' comments in the next page.

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The necessity of designing a cooling vest for women considering their activity in different sectors

*Please correct these "strongly disagreed", "disagreed", "normal", -2 "agreed",/ there is nothing as the word 'agreed' in English*1.Strongly disagree2.disagree 3.undecided 4.agree 5.strongly agree

*The authors should provide more explanation about the word 'pack' in the .manuscript*3

packs of 150 gr with 9 × 16 cm dimensions and 2 packs of 120 gr with 8 × 7 .3 14cm dimensions were used for the designed vest. The purpose of the researchers was to design a vest with a lower weight, with greater flexibility and .more comfort than the ones made for men

The ice gel packs consisted of water and a water-absorbent polymer packaged in .a 300-micron thick plastic coating

The authors have only had woman with the age range of 24-25 years old as .4 the subjects of their study. Therefore no specific information about the older subject who might be present in several workplaces is presented by this study

Since the study had to be conducted in a climatic chamber and we did not have access to older women in the required workplaces, we had to use the students of this range of age in the study

.

The discussion is short and does not consider a group of other studies which -5 have been conducted in this field. It is strongly recommended that the authors add more comparisons by considering several other references

A study was conducted by Brent Alumbaugh et al. on eleven female collegiate swimmers, with the aim to compare the effect of precooling on the core temperature, rating of the perceived exertion , and heart rate during swimming

1600 yard in two different conditions, i.e. 1) the precooling condition, where the female volunteers rested on the pool deck while wearing an ice vest and wet t-shirt prior to beginning the warm up, and 2) a control condition, where the female volunteers did not participate in any precooling procedures. The results showed that the CTs (core temperature) of the precooling group were significantly lower (37.88±4° C) than the control condition (38.17±.19 ° C, P=.02), while the HRs (heart rate) of the precooling group were not significantly different (P=.20). The RPEs (rating of the perceived exertion) were not significantly different in comparison.

In a study by Sigurbjo¨rn A´. Arngrı´msson et al. conducted on seventeen competitive runners (9 men and 8 women), with the aim to investigate the effect of the cooling vest worn during an active warm-up on improving the 5-km running performance in the heat. The volunteers completed two simulated 5-km runs on a treadmill after a 38-min active warm-up during which they wore either a T-shirt (C) or a cooling vest (V) in a hot, humid environment. The results showed that wearing the cooling vest during the warm-up significantly decreases the body temperature, heart rate (HR), and perception of thermal discomfort during the warm-up compared to the control group. The physiological and performance effects of wearing cooling vests during warm-up were similar both in men and in women, in this study.

. 2. The inclusion and exclusion criteria, and ethical issues considered for the participants of Step 1 should be mentioned.

The inclusion criteria for the participants for the study include the lack cardiovascular and musculoskeletal disorders, seizure, epilepsy, pulmonary, neurological, diabetes, and not consuming hypertension medications affecting the heart rate, not consuming coffee, caffeine and alcohol, 12 hours before the test. Before the test, the subjects were examined by the physician to meet the inclusion criteria to the test.

The exclusion criteria included an increase in person's heart rate over 180 beats /min and a temperature over 39 ° C, as well as excessive fatigue

Explain the strategy of the laboratory conditions considered at both stages .3 (based on previous studies or other

Due to the lack of students adapting to the hot environment, WBGT were . selected between the range of Action Limit and OEL

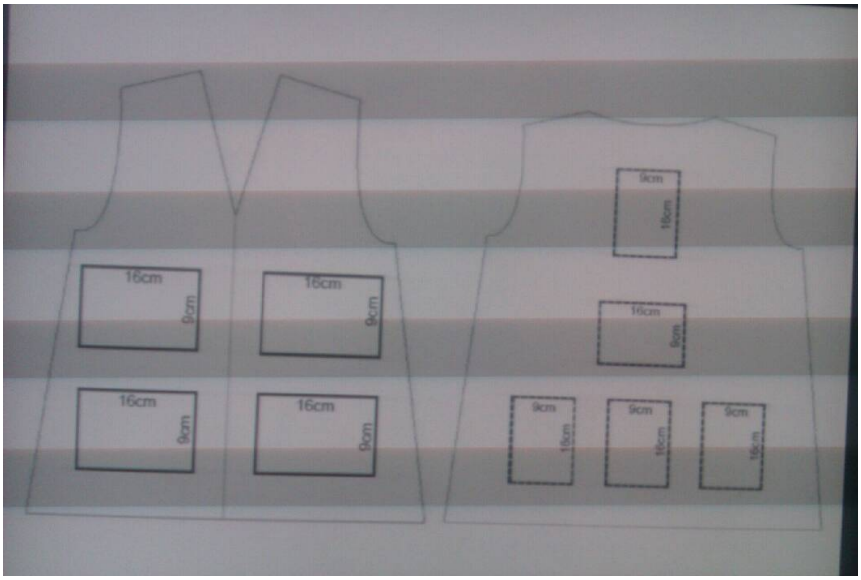
Further explanation is required in Figure 1 (a: .4

… b:…., c…..)

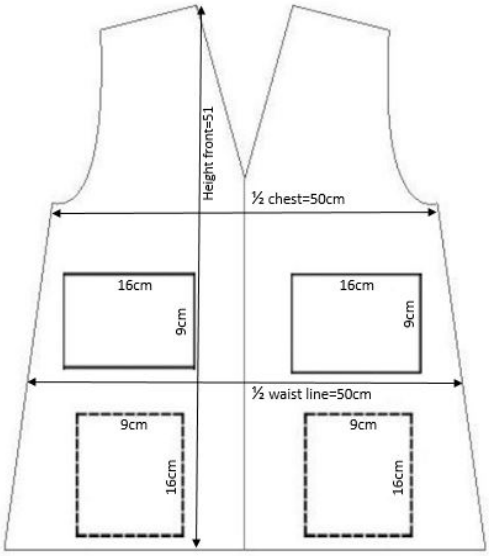
: a:Nine pockets were designed Inside the vest for the fitting the cooling packs. The number of pockets in front of the vest was 4, and at the back was 5.

b: To prevent the pressure, the placement of packs in the front of the vest was designed lower than the breasts. The shoulder region was designed by considering the adjustability for the upper body and waist area was designed with the ability to change its size for tightening and widening the cooling vest. The pack position has been changed from horizontal to vertical in the lower part of the front section. and pack sizes changed from9 × 16 cm to 8 × 14cm

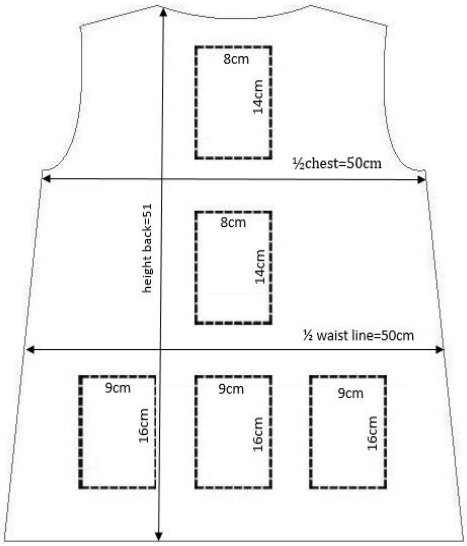
c:The pack position has been changed from horizontal to vertical in upper part of the back section in order to provide greater flexibility and a better thermal feeling.



Step:a



Step: b



step :c

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It is suggested that the subtitle "Method" be changed to "Study design" .5 (page 4, step 2)

The results of Demographic characteristics of both studied sample should be .1 .mentioned separately

The mean and standard deviation of age and weight of participants were 23.7 ± 1.25and 56.40 ± 6.099, respectively

The results of the first step need to be described in the Results part .2

Table1: Mean values and standard deviations of Assess the comfort of the cooling vest and TS at each design step are given in Table 1.

step	Assess the comfort of the vest	TS

a	2.9293±.22373	2.5000±.24513
b	3.4242±.19763	±.191072.1000
c	4.0404±.12445	±.125091.8429

Please add P-values to the Table 1 .4

Parameter	Test mode	Minimum	Maximum	Mean and standard deviation	p-value
WBGT	Without the cooling vest	29.15	33.08	30.1687±0.9243	131.
	With the cooling vest	29.38	30.85	29.8667±0.3975	
Air temperature	Without the cooling vest	36.45	39.53	37.7638±0.6151	350.
	With the cooling vest	35.92	39.57	37.6082±0.8966	
Wet temperature	Without the cooling vest	25.35	28.15	26.4375±0.8030	464.
	With the cooling vest	25.5	27.27	26.3083±0.4621	
Relative humidity	Without the cooling vest	33.95	47.7	39.182±3.3486	959.
	With the cooling vest	33.07	47.15	39.1275±3.9899	

i t is suggested that the results of this study be compared and interpreted with a similar study among men

Zare et al. conducted a study on 15 men, aiming to compare the effect of the optimized ice cooling vest and a paraffin cooling vest as well as the no-vest condition on physiological and perceptual strain. The participants carried out the test in a climatic chamber (40 °C, 40%) on a treadmill (2/8km/hr. and 0 ° gradient) condition for 60 min. The PSI and PeSI were measured every 5 and 15 minutes, respectively. The results showed a significant difference between the mean of PeSI, and PSI in the exercise with and without the cooling vests ($P<0.05$). The results are consistent with the results of the present study with the women participants.

The limitations of the study need to be mentioned .2

. .

Students did not cooperate to carried out the test due to thermal condition in the climatic chamber Therefore, the test time without the cooling vest mode .was less than the time with the cooling vest mode

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Revision (1)

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REFEREE: Associate Editor | **Revision** (1) 7 Apr 2020

Dear EIC
The article was carefully evaluated. The authors have made the necessary corrections based on reviewers' opinions. I think this article is suitable for publication.
Best

REFEREE: EIC | **Revision** (1) 7 Apr 2020

Dear Author
The article was carefully evaluated. I think this article is suitable for publication.
Best