IOSR Journal of Sports and Physical Education (IOSR-JSPE)
e-ISSN: 2347-6737, p-ISSN: 2347-6745, Volume 5, Issue 1, (Jan - Feb 2018), PP 13-21
www.iosrjournals.org

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Effect of Music on Percieved Exertion, Enjoyment, Mood and Affect during High Intensity Interval Training

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Abstract: *There is increase in physical inactivity. Lack of time is been the most common reason for physical inactivity. High intensity interval training (HIIT) is the most time efficient exercise strategy. But HIIT involves high negative affect and high Rate of perceived exertion. Music is thought to affect senses allowing the separation of thought from feeling, thereby altering ones perception of unpleasant feeling. The purpose of this study was to find the effect of music on perceived exertion, enjoyment, mood and affect during high intensity interval training.30 participants were selected as per the inclusion and exclusion criteria. They were divided into 2 groups: group A performed with music and group B performed without music condition HIIT. To control for order effects, trial order was counterbalanced. Mood was assessed pre and post using Abbreviated Profile Of Mood State (POMS), RPE and affect were taken over time using the Borg CR-10 scale and the Feeling scale respectively , enjoyment was assessed post HIIT using the Physical Activity Enjoyment Scale (PACES) . From the present study it was concluded that music had positive effect on enjoyment , affect and rate of perceived exertion and has no effect on mood in high intensity interval training exercise when compared to without music conditioned High intensity interval exercise , and thus may increase the exercise adherence to it .*

Keywords: *Affect, Enjoyment, High intensity interval training, Mood, Music, Rate of perceived exertion.*

Date of Submission: 12-01-2018 Date of acceptance: 29-01-2018

I. Introduction

American college of sports medicine (ACSM) defines physical activity as bodily movement that is produced by the contraction of skeletal muscle and that substantially increases energy expenditure.[1]According to the new guidelines stated by ACSM adults aged 18-65 years should continue to accumulate at least 30 minutes of moderate-intensity physical activity 5 days per week (instead of "most days of the week") or engage in 20-minutes of vigorous physical activity 3 days per week.[2] Regular physical activity has significant benefits for health. Physical activity can reduce the risk of cardiovascular diseases, diabetes, colon and breast cancer, and depression , help decrease the risk of a hip or vertebral fracture and help control weight.[1]Despite overwhelming scientific evidence that regular physical activity is effective in the prevention of chronic diseases and premature death, most adults fail to meet even the minimum physical activity guidelines , so it has become a challenge for the public health sector to find effective ways to increase physical activity.The pervasiveness of physical inactivity has become a widespread public health concern.[3] One out of five adults around the world is physically inactive.[4] Physical inactivity has been identified as the fourth leading risk factor for global mortality causing an estimated 3.2 million deaths globally.According to WHO guidelines, Global Health Observatory (GHO) data states "Globally in 2010, 23% of adults aged 18+ years were insufficiently active (men 20% and women 27%).Globally, 81% of school going adolescents aged 11–17 years were insufficiently physically active in 2010, i.e. they did less than 60 minutes of moderate- to vigorous-intensity physical activity daily, as recommended by WHO. Countless studies have been done to find the cause for the lack of physical activity. The most commonly cited reason for not exercising is a ''lack of time''. [5][6] This finding is common ; regardless of age, ethnicity, sex, or health status, people report that a lack of time is the primary reason for their failure to exercise on a regular basis.[7][8][9]Given that lack of time is such a common barrier to exercise participation and there is increasing need of regular physical activity. Physical activity prescription innovations that yield benefits with minimal time commitments represent a potentially valuable approach to increasing population activity levels and population health. In recent studies it has been proven that High Intensity Interval Training (HIIT) is a time efficient strategy. [10]

HIIT may help insufficiently active individuals overcome a major barrier to maintaining a physically active lifestyle, that of a perceived lack of time. An added bonus is that from a time: benefit perspective, HIIT may prove to be a good example where less can be more. [11]. this type of training involves repeated bouts of

high intensity effort followed by varied recovery times. The intense work periods may range from 5 seconds to 8 minutes long, and are performed at 80% to 95% of a person's estimated maximal heart rate, the maximum number of times your heart will beat in a minute without overexerting yourself. The recovery periods may last equally as long as the work periods and are usually performed at 40% to 50% of a person's estimated maximal heart rate. The workout continues with the alternating work and relief periods to a total of 20 to 60 minutes. HIIT training can easily be modified for people of all fitness levels and special conditions, such as overweight and diabetes. HIIT workouts can be performed on all exercise modes, including cycling, walking, swimming, aqua training, elliptical cross-training, and in many group exercise classes. HIIT workouts provide similar fitness benefits as continuous endurance workouts, but in shorter periods of time. This is because HIIT workouts tend to burn more calories than traditional workouts, especially after the workout. The post-exercise period is called "EPOC", which stands for excess post exercise oxygen consumption. This is generally about a 2-hour period after an exercise bout where the body is restoring itself to pre-exercise levels, and thus using more energy. Because of the vigorous contractile nature of HIIT workouts, the EPOC generally tends to be modestly greater, adding about 6 to 15% more calories to the overall workout energy expenditure.[12]HIIT is very useful in various health condition and benefits in various fields and is superior to the traditional Moderate Intensity Continuous Training . [13][14][15][16][17][18]although there are various benefits of HIIT lower responses on the feeling scale ($p \leq 0.01$) and higher responses on the felt arousal scale ($p \leq 0.001$) and the rating of perceived exertion were obtained during the HIIT session.[18][19] This may limit the adherence to this time-effective training mode.[20]Many research also conclude that exercise-related increases in positive affect and decreases in feelings of fatigue can aid in the successful translation of exercise intentions into behaviour and improve adherence to exercise[21]. It is known that several sensory modalities are required to affect perceived exertion and attention allocation while engaging in demanding workload. External stimuli may serve as mediating agents in diverting attention away from internal and painful stimuli. This distraction may likely contribute to the pleasantness of the exercise experience, ultimately leading to increased exercise participation and reduced dropout rates. [22]

Music is one such sensory modality that can have an effect on exercise. According to the available evidence, music captures attention, triggers a range of emotions, has positive effect on mood, evokes memories, increases work output, heightens arousal, reduces inhibitions and encourages rhythmic movement, all these purposes have considerable application in the exercise domain. Music has an ergogenic effect and it is evident when music improves exercise performance by either delaying fatigue or increasing work output. In this sense, music can be thought of as a type of performance-enhancing drug.Music has on reducing rate of perceived exertion and enhances affective states and work output in submaximal exercise. [23] It is reported that the intensity of exercise determines the extent to which music can inhibit the processing of other sensory cues. [24]At high intensity levels, physiological cues appear to dominate processing capacity due to their relative strength, while at the more moderate intensity levels of exercise, both internal (e.g., kinaesthetic) and external (e.g., music) cues can be processed in parallel. While the positive effects of music on how one feels may not have the power to alter the perceptions of fatigue when exercising at a very high intensity, music may change how one interprets or responds to sensations of high exertion .[25] In other words, although it is not possible to distract exercisers from the fatigue induced by high-intensity exercise, it is possible to change their perception of this fatigue towards a more positive evaluation; ostensibly music appears to 'colour' the interpretation of fatigue .[26]Effect of music on high intensity exercise is contradictory there are research's that do not support the use of music in high intensity exercise.[27] there are many researches that support the use of music in high intensity exercise.[28][29][30]

To our knowledge, the psychological effects of music and their subsequent influence on performance have not been evaluated using an intermittent high-intensity exercise protocol. Since HIIT is the most time efficient , but is associated with high Rate of perceived exertion (RPE) and negative affect and since RPE ,affect, mood and enjoyment are determinants of exercise adherence and music has a positive impact on these measures , this study concentrates on the effect of music on RPE , affect , mood and enjoyment thus improve adherence during HIIT .

II. Methodology

2.1. Equipment to be used:
2.1.1. Treadmill
2.1.2. Polar HR moniter
2.1.3. Headphones
2.1.4. Phone
2.2. Materials to be used:
2.2.1. Consent form
2.2.2. Data collection sheet

2.2.3. Recording sheet
2.2.4. Pen
2.2.5. Pencil
2.3. SELECTION CRITERIA:
2.3.1. Inclusion criteria:

- Healthy and moderately active individual (as assessed by the International Physical Activity Questionnaire-Short Form (IPAQ))
- Having BMI 18.5 – 22.9 (Asian criteria for normal weight)
- Age between 20-30
- Participants willing to participate.

2.3.2 Exclusion criteria:

- Athletes.
- Participants contraindicated to exercise based on the Physical Activity Readiness scale.
- Participants not willing to participate**.**

2.4. Pre-test protocol:

Participants were selected as per the inclusion and exclusion criteria. During this session subjects were asked to read and sign informed consent form and answer the PAR-Q (Physical Activity Readiness Questionnaire), and the IPAQ-SF (International Physical Activity Questionnaire).The height and weight of each person was taken .The scales RPE scale , feeling scale, mood scale , enjoyment scale where explained to the patient .

2.5. Music selection:

Participants were instructed to write a list of six songs (ranked in order by preference) that they would enjoy listening to while exercising. These songs were used to create a personalized music playlist for each participant.

2.6. PROCEDURE:

Participants were asked to perform 2 HIIT exercise trials: one with music (preferred music as selected by the participants was played on headphones) and other without music. To control for order effects, trial order was counterbalanced meaning there were 2 groups, group A performed with music and group B without music and for the second trial the groups were interchanged that means now group A performed without music and group B with music. Before starting the protocol, Heart Rate maximum (HRmax) was calculated for each participant using the age-estimated equation (220-age). From the obtained HRmax value, the following targets were determined: 85% HRmax and 20%HRmax. The participants were made to wear the Polar HR moniter.

Before the start of exercise the participants had to fill the profile of moods scale. Then according to ACSM guidelines for high intensity interval training, participants started with 5 mins warm up followed by 2min of high intensity (80%hrmax) 4 times with 4 minutes interval period between each exercise at low intensity (20% hrmax) with music for group A and without music for group B .During each trial measures of affect and RPE were taken. For which the participants had to answer how hard was the physical activity and how they feel about the physical activity before , after and at half time of each phase of HIIT i.e. during warm-up , high intensity bout 1, 2,3 , during rest period between bouts 1 ,2,3 and cool down , with participants simply pointing to which number most closely reflected their current state. On Completion of the 20 min trial was followed by a 3 min cool-down, performed at a self-selected intensity. Post-task enjoyment was assessed using the PACES scale and post task mood assessed using the profile of moods scale. Participants were asked to rest for an additional 60 min after the exercise. The next HIIT took place at least 1 week after the first session in which groups were interchanged i.e. Participants of Group A performed with music and Group B performed without music.

III. Data Analysis And Result

Table no.1. Rate of perceived exertion (RPE) over time withvs. without music condition HIIT.

	WITH MUSIC	WITHOUT MUSIC	P VALUE	T VALUE	RESULT
	MEAN±SD	MEAN±SD			
PRE	7±O.OOO	7±0.000			
WARMUP	7±O.OOO	7±0.000			
BOUT 1	10.8±1.990	11.46±1.717	0.1700	1.390	NOT SIGNIFICANT
REST 1	7.93±1.258	8.4±1.589	0.2122	1.261	NOT SIGNIFICANT
BOUT 2	10.2±2.007	11.26±1.639	0.279	2.235	SIGNIFICANT
REST 2	8.06±1.363	8.133±1.358	0.8501	0.1899	NOT SIGNIFICANT
BOUT 3	9.8±2.007	11±1.661	0.0144	0.523	SIGNIFICANT
REST 3	8.2±1.448	8.066±1.258	0.7048	0.3808	NOT SIGNIFICANT
COOL DOWN	7.066±0.3651	7.2±0.8052	0.4122	0.8260	NOT SIGNIFICANT
POST	7±0.000	7.066±0.3651			

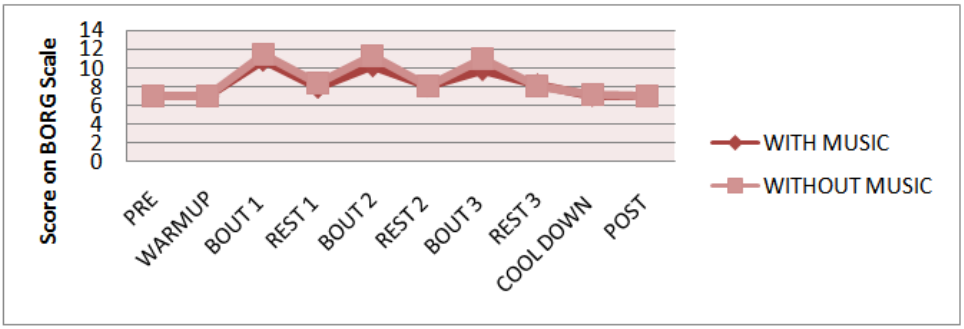


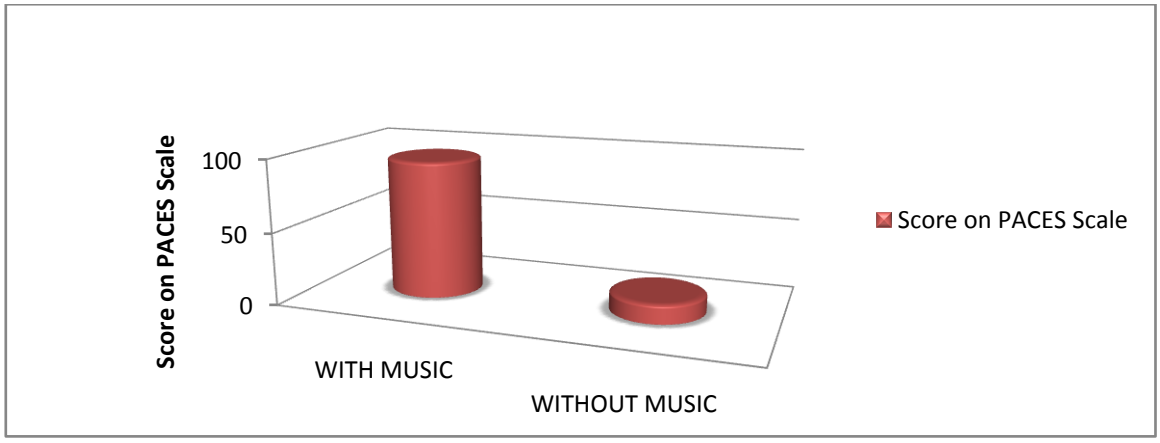
Fig.no.1. shows comparisonof RPE over time with music and without music condition HIIT.

RESULT NO.1.

1) On comparison of RPE during PRE EXERCISE PERIOD between with music condition and without music condition HIIT using unpaired 't' test , where p value is 0.1700 and p value is 1.390 , is indicated not significant .
2) On comparison of RPE during WARM UP between with music condition and without music condition HIIT using unpaired 't' test , where p value i , is indicated significant.
3) On comparison of RPE during BOUT 1 between with music condition and without music condition HIIT using unpaired 't' test HIIT, where p value is 0.1700 and p value is 1.390, is indicated not significant.
4) On comparison of RPE during REST 1 between with music condition and without music condition HIIT using unpaired't' test ,where p value is 0.2122 and t value is 1.261 indicated not significant.
5) On comparison of RPE during BOUT 2 between with music condition and without music condition HIIT using unpaired 't' test, where p value is 0.279 and t value is 2.255, is indicated significant.
6) On comparison of RPE during REST 2 between with music condition and without music condition HIIT using unpaired 't' test, where p value is 0.8501 and t value is 0.1899, is indicated not significant.
7) On comparison of RPE during BOUT 3 between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.0144 and t value is 2.523 , is indicated significant.
8) On comparison of RPE during REST 3 between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.7048 and t value is 0.3808 , is indicated not significant.
9) On comparison HIIT of RPE during COOL DOWN between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.7048 and t value is 0.8260 , is indicated not significant.
10) On comparison of RPE during POST EXERCISE PERIOD between with music condition and without music condition HIIT using unpaired 't' test , where t value is and p value is , is indicated significant.

TABLE NO.2: Comparison of mean post exercise enjoyment between with music and without music condition HIIT.

	MEAN ±SD	P VALUE	T VALUE	RESULT
WITH MUSIC	96.033±13.132	<0.0001	13.684	EXTREMELLY SIGNIFICANT
WITHOUT MUSIC	46.6±14.801			



Graph.no.2.shows comparison of post exercise enjoyment between with music and without music condition HIIT

RESULT NO. 2:
GRAPH.NO.2. shows that on comparison of post exercise enjoyment between with music condition and without music condition high intensity interval training using unpaired 't' test , where p value was < o.ooo1 and t value was 13.684 , which is extremely significant .

TABLE NO.3: Comparison of mean in post mood between with music and without music condition HIIT.

	POST WITHOUT MEAN±SD	POST WITH MEAN±SD	P VALUE	T VALUE	RESULT
TENSION	1.5±2.675	0.73±1.112	0.1526	1.450	NOT SIGNIFICANT
ANGER	0.866±1.995	0.86 ±1.69	>0.9999	0.0000	NOT SIGNIFICANT
FATIGUE	3.7333±4.211	3.16±3.51	O.5578	0.5895	NOT SIGNIFICANT
DEPRESSION	0.7±2.466	0.266±0.82	0.3652	0.9126	NOT SIGNIFICANT
CONFUSION	1.13±3.34	0.83±1.80	0.666	0.4330	NOT SIGNIFICANT
VIGOUR	10.5±4.8	11.8±4.874	0.317	1.009	NOT SIGNICANT
ERA	18.3±3.8	19.6 ±3.5	2.1617	1.417	NOT SIGNIFICANT
TMD	21.7±11.6	25.03±9.242	0.2257	1.225	NOT SIGNIFICANT

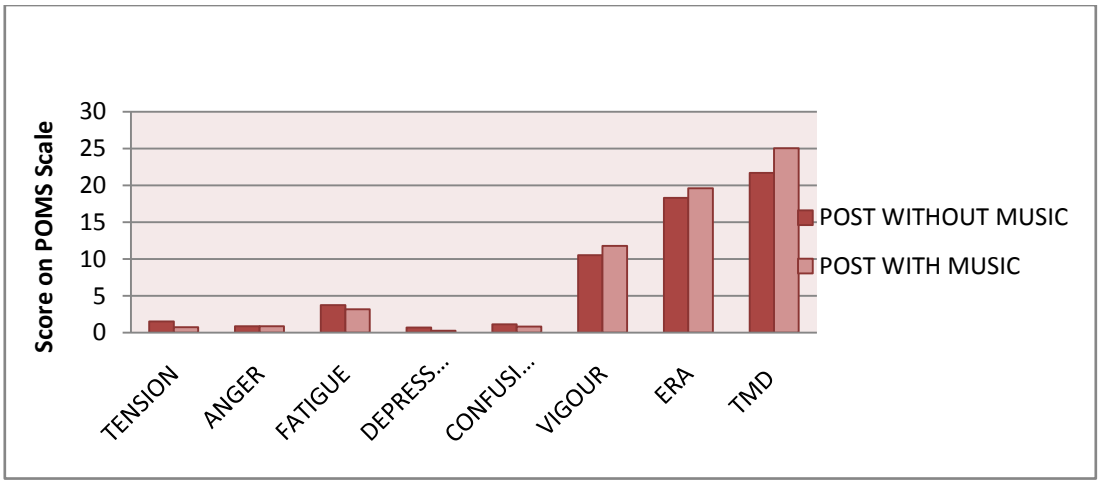


Fig.no.3.showscomparison of mean in post mood between with and without music condition HIIT.

RESULT 3:
Fig.no.3 SHOWS THAT

1) On comparison of mean in post TENSION between with and without music condition, where p value is 0.1526 and t value is 1.450, is indicated not significant.
2) On comparison of mean in post ANGER between with and without music condition, where p value is >0.999 and t value is 0.000, is indicated not significant.
3) On comparison of mean in post FATIGUE between with and without music condition, where p value is 0.5578 and t value is 0.5895, is indicated not significant.
4) On comparison of mean in post-DEPRESSION between with and without music condition, where p value is 0.3652 and t value is 0.9126, is indicated not significant.
5) On comparison of mean in post CONFUSION between with and without music condition, where p value is 0.666 and t value is 0.433, is indicated not significant.
6) On comparison of mean in post VIGOUR between with and without music condition, where p value is 0.317 and t value is 1.009, is indicated not significant.
7) On comparison of mean in post ERA between with and without music condition, where p value is 2.1617 and t value is 1.417, is indicated not significant.
8) On comparison of mean in post TMD between with and without music condition, where p value is 0.2257 and t value is 1.225, is indicated not significant.

TABLE NO.4:
Comparison between mean affect over time during with music and without music condition HIIT.

	WITH MUSIC MEAN±SD	WITHOUT MUSIC MEAN±SD	P VALUE	T VALUE	RESULT
PRE	1.633±1.497	1.266±1..461	O.3406	0.9603	NOT SIGNIFICANT
WARMUP	2.766±1.695	1.633±1.299	0.0052	2.906	VERY SIGNIFICANT

BOUT 1	2.966±1.921	1.466±1.737	0.0024	3.173	VERY SIGNIFICANT
REST 1	3.6±1.545	2.166±1.599	0.0008	3.531	EXTREMELY SIGNIFICANT
BOUT 2	3,2±1.827	1.766±2.366	0.0019	3.260	VERY SIGNIFICANT
REST 2	3.766±1.755	2.366±1.650	0.0023	3.183	VERY SIGNIFICANT
BOUT 3	3.9±1.447	2.1±1.689	<0.001	4.434	EXTREMELY SIGNIFICANT
REST 3	4.16±1.341	2.433±1.654	<0.001	4.458	EXTREMELY SIGNIFICANT
COOL DOWN	4.1±1.348	2.3±1.512	<0.001	4.867	EXTREMELY SIGNIFICANT
POST	4.1±1.348	2.3±1.512	<0.001	4.867	EXTREMELY SIGNIFICANT

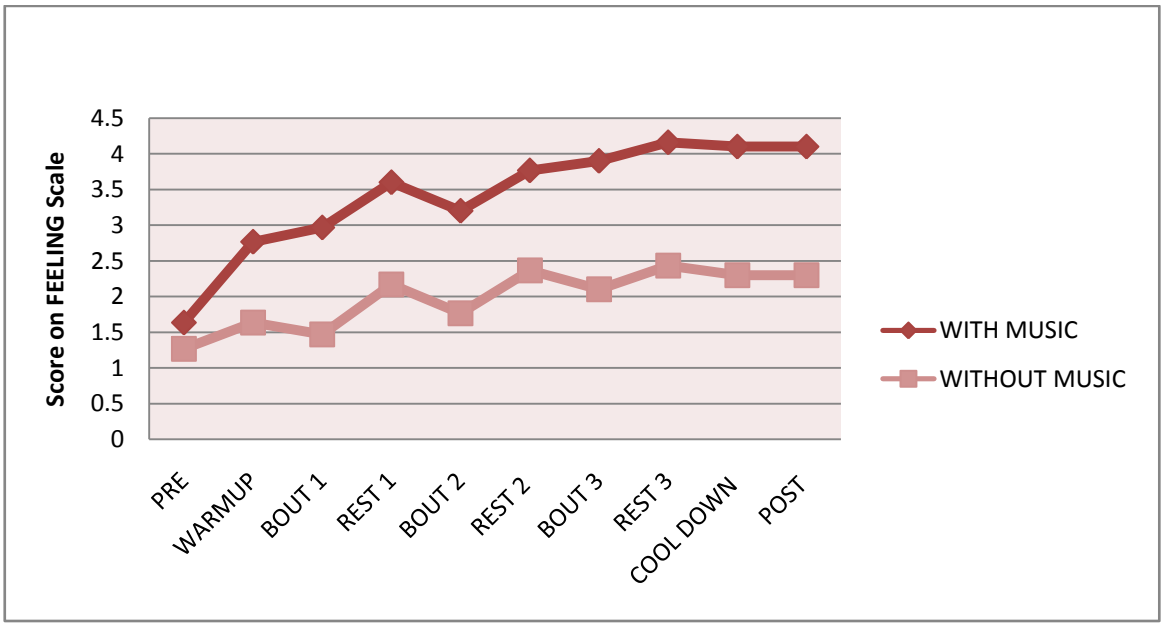


Fig.no.4. shows comparison between mean affect over time during with music and without music condition HIIT.

RESULT NO 4:
Fig.no.4 SHOWS THAT

1) On comparison of feeling during PRE EXERCISE PERIOD between with music condition and without music condition HIIT using unpaired 't' test , where p value is 0.3406 and t value is 0.9603 , is indicated not significant.
2) On comparison of feeling during WARM UP between with music condition and without music condition HIIT using unpaired 't' test , where p value is 0.0052 and t value is 2.906 , is indicated very significant .
3) On comparison of feeling during BOUT 1 between with music condition and without music condition HIIT using unpaired't' test HIIT , where p value is 0.0024 and t value is 3.173 , is indicated very significant.
4) On comparison of feeling during REST 1 between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.0008 and t value is 3.531 , is indicated extremely significant.
5) On comparison of feeling during BOUT 2 between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.0019 and t value is 3.260 , is indicated very significant.
6) On comparison of feeling during REST 2 between with music condition and without music condition HIIT using unpaired't' test , where p value is 0.0023 and t value is 3.183 , is indicated very significant.
7) On comparison of feeling during BOUT 3 between with music condition and without music condition HIIT using unpaired 't' test , where p value is <0.001 and t value is 4.434 , is indicated extremely significant.
8) On comparison of feeling during REST 3 between with music condition and without music condition HIIT using unpaired 't' test , where p value is <0.001 and t value is 4.458 , is indicated extremely significant.
9) On comparison of feeling during COOL DOWN between with music condition and without music condition HIIT using unpaired 't' test , where p value is <0.001 and t value is 4.867 , is indicated extremely significant.

10) On comparison of feeling during POST EXERCISE PERIOD between with music condition and without music condition HIIT using unpaired 't' test , where p value is <0.001 and t value is 4. 867, is indicated extremely significant.

IV. Discussion

The present study "EFFECT OF MUSIC ON PERCIEVED EXERTION, ENJOYMENT, MOOD AND AFFECT DURING HIGH INTENSTITY INTERVAL TRAINING (HIIT)" was conducted from department of community physiotherapy, Dr. APJ Abdul Kalam College of physiotherapy, Loni. 30 students from Pravara institute of medical science were included in the study. The participants had to perform 2 HIIT protocols one with music and another without music. To control for order effects, trial order was counterbalanced. The effect of music on HIIT protocol was assessed by seen the difference in pre and post mood as assed by profile of mood states(POMS) , Rate of perceived exertion(RPE) measured by BORG 6-20 RPE (CATEGORY) SCALE, affect as measured by Feeling scale and post exercise enjoyment as assessed by physical activity enjoyment scale(PACES) . The result was found that there was no significant difference in pre and post mood, extremely significant difference in post exercise enjoyment, significant difference in only Bout 2, bout3 and very and extremely significant difference in affect across time when compared within with and without music condition HIIT.

RATE OF PERCEIVED EXERTION

The result of this study showed that there was significant difference in bout 2 and bout 3 and no significant difference across pre exercise , warmup,bou1,rest1,rest2,rest 3, cool down and post exercise RPE in between with music and without music conditioned HIIT .

Study done by V.M.nethery, competition in internal and external sources of information on exercise: influence on RPE and the impact on exercise load showed that there was significant reduction in RPE in music condition in heavy workloads when compared with control, sensory deprived and video condition .[31]

Study done by Martin J. Barwood, A Motivational Music and Video Intervention Improves High-Intensity Exercise Performance , in this study Each participant completed three 30-minute exercise bouts on a motorised treadmill under three counterbalanced conditions on separate days: control (CON), motivational music plus video intervention (M), non-motivational intervention (NM).the study proved that music conditioned High intensity exercise showed lower RPE as compared to control and non-motivational intervention high intensity exercise. [32]

There is no difference in RPE during warm up , rest 1 , rest 2 , rest 3 , cool down , this might be due to use of Borg 6-20 category scale , which showed 6 as the lowest point on scale on exertion . So there might be a scope for future studies to continue the same trial by using the Borg CR – 10 scales.

So, although there are contradictory results, that music might or might not decrease RPE during high intensity exercise. The present study and the above studies support the finding that music reduces rate of perceived exertion during high intensity exercise. As the present study on effect of music on HIIT protocol that included alternate high intensity bouts , interspersed with moderate intensity , the study shows reduction in RPE during high intensity bouts , thus proving participants having have low fatigue less , thus making the exercise effort more pleasurable and thus improving the exercise adherence .

ENJOYMENT

The results of this study showed there was extremely significant difference in the perceived enjoyment of with and without music conditioned HIIT. STORK et al studied a similar study to see the effect preferred music on perceived enjoyment of sprint interval exercise and found similar result. It has been suggested that increase in enjoyment of exercise can increase in adherence to that exercise .[33] so it can be suggested that participants would adhere more to HIIT with music as they perceive it as been more enjoyable and would more adhere to the exercise when music is added to it.

MOOD

The results of the study showed although there was significant difference in pre and post mood in with music and without music condition HIIT, but there was no significant difference in post mood on comparison of with music and without music condition.

A study done by Sterling K. MacNay, M.M.E., RMT-BC on the Influence of Preferred Music on the Perceived Exertion, Mood, and Time Estimation Scores of Patients Participating in a Cardiac Rehabilitation Exercise Program showed increase in positive mood with preferred music . In the present study a single session, the subjects demonstrated a statistically significant decrease in the mean values of the factors tension, depression, confusion and anger; an increase in vigour, ERA and TMD and no differences in fatigue in both

condition i.e. HIIT with music and HIIT without music. These results are in line with earlier study results providing evidence for mood-enhanced benefits of exercise. [34]

The changes in anxiety, depression and mood states after exercise are explained most frequently by the endorphin and monoamine hypotheses. Exercise may also increase body temperature, blood circulation in the brain and impact on hypothalamic-pituitary-adrenal axis and physiological reactivity to stress. The possible psychological mechanisms include improvement of self-efficacy, distraction and cognitive dissonance. [35]
The present study shows that there was no difference in mood in music and without music condition HIIT.

AFFECT

The result of this study shows that show there is significant or very significant and extremely significant change in affect across time i.e. in pre exercise , warm up , bout 1 ,2,3 and rest 1,2,3,cool down , post . This finding is in accordance withKarageorghis CI, Priest DL. Music in the exercise domain: a review and synthesis (Part I)which states that At high intensity levels, physiological cues appear to dominate processing capacity due to their relative strength, while at the more moderate intensity levels of exercise, both internal (e.g., kinaesthetic) and external (e.g., music) cues can be processed in parallel. While the positive effects of music on how one feels may not have the power to alter the perceptions of fatigue when exercising at a very high intensity, music may change how one interprets or responds to sensations of high exertion. In other words, although it is not possible to distract exercisers from the fatigue induced by high-intensity exercise, it is possible to change their perception of this fatigue towards a more positive evaluation; ostensibly music appears to 'colour' the interpretation of fatigue. [36]

A study conducted by Stephen H. Boutcher et al The Effects of Sensory Deprivation and Music on Perceived Exertion and Affect During Exercise proved that music increases positive affect at both moderate and heavy workloads had similar results .[37]The study conducted by JASMIN C. HUTCHINSON also had similar results in his study, he stated that music increases the work output, task motivation and affect of exercise although it does not decrease the perceived exertion.[38}

The present study shows the finding that Music has positive effect on affect over time on HIIT it can be stated that it improves adherence to exercise by increasing the pleasantness of exercise. Many researches also conclude that exercise-related increases in positive affect and decreases in feelings of fatigue can aid in the successful translation of exercise intentions into behaviour and improve adherence to exercise. [39]

V. Conclusion

From the present study it was concluded that music has no effect on mood and positive effect on enjoyment , affect and rate of perceived exertion in high intensity interval training exercise when compared to without music conditioned High intensity interval exercise . Limitations of the study the study was conducted on less participants and the study was conducted at single centre. In future effect of music can be found out in different training programs and the study can be conducted for longer duration .

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Charmi Chetan Mehta "Effect of Music on Percieved Exertion, Enjoyment, Mood and Affect during High Intensity Interval Training." IOSR Journal of Sports and Physical Education (IOSR-JSPE) , vol. 05, no. 1, 2018, pp. 13-21.