International Journal of Engineering & Technology, 7 (3.7) (2018) 192-196

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research paper

Physical Fitness Status Among Female Reserve Officers Training Unit (ROTU).-The Pre-test.

Mohar Kassim[1], *Norfazilawati Othman[1], *Shahrulfadly Rustam[2] & *Edawaty Ujang[3]

[1]Centre of Coaching Science, Faculty of Science and Technology, National Defence University of Malaysia.
**Corresponding author: * Norfazilawati Othman, Shahrulfadly Rustam & *Edawaty Ujang: Centre of Coaching Science, Faculty of Science and Technology, National Defence University of Malaysia.*
**Corresponding author E-mail: mohar@upnm.edu.my*

Abstract

The ROTU cadets are trained to become an officer who are always ready to defence and resilience the country from all threats. The fitness level of each female ROTU cadets can be measured more systematically and accurately by implementing the test batteries. The objective of this study is to measure the fitness level among the female ROTU cadets based on the seven test, secondly to produce the Fitness Training Manual for the female ROTU cadet and thirdly to build the physical norms based on the seven test battery among the female ROTU cadets in UPNM. The whole research will involve 3 phases, pre-test for basic data collection, (4 weeks), intervention (12 weeks) and post data collection (4 weeks). From the purposive sampling, 212 female ROTU cadets were selected as the sample of the study. The instruments for pre-data collection involved the 7 test batteries (2.4 km running, sit-up, push up, 30-meter sprint, 10-meter zigzag, sit and reach and stand long jump) and self-administered questionnaire for demographic characteristics. The results of the pre-test came out with the seven physical fitness norms among female PALAPES cadet based on their age (19, 20 & 21). In conclusion, this physical fitness norm helps in the classification of physical fitness among the female ROTU cadets in UPNM. In average, the pretest showed not more than than 30% of them have an excellent physical fitness. The results of this study and the Fitness Training Manual can be used as a reference for future scientific studies especially among ROTU cadets in Malaysia.

Keywords: *Norms, Physical fitness, test batteries, female, ROTU.*

1. Introduction

In the course of various activities or daily routines, regardless of working, sports or recreation, whether light, moderate or heavy exercise, we will not be able to implement it without optimal fitness. That is the reason why fitness is very important in human life. Fitness is also a condition where someone has the ability to do his daily work without lethargy, using minimal energy while having extra energy that enables him to perform more challenging activities [1]. Anything we do in daily life, we need physical fitness that includes physical, mental, emotional, social and spiritual aspects. It is a universal concept that allows a person to live perfectly and energetically [2].

In National Defence University of Malaysia (NDUM), there are about 440 male and female ROTU (Reserve Officers Training Unit) cadets aged 19, 20 and 21. ROTU was established to train officer among male and female students from institutions of higher learning. It serves to train potential military personnel ROTU might be doubtfully does not reach the standard to be achieved, since the standard activity or fitness module is not being implemented among them in daily exercise routine.However, there are still questions to consider, are we aware of the extent of ROTU fitness in our country (especially among female)? There is certainly a probability that, the fitness level among female In addition, there are also overweight phenomena increasing everywhere. As we can see, the prevalence of obesity amongst young people is increasing especially in developing countries. This is one of the most challenging phenomena in the military as well [3]. Therefore, by conducting the test batteries against the target group, the fitness level of each PALAPES cadet can be measured and proactive measures can be implemented to make them to be a vibrant defense officer.

The importance of building fitness norms has been proven when the study on the construction of physical fitness norms has been much done especially among athletes and students [4-6]. Baumgarner et. Al., 2004 stated that the percentile norm is very effective and very helpful in his study among sports science students at the University [7]. He suggested researchers to continue practicing fitness norms among college students for more benefit in physical fitness. The main objective in this study is to test the level of physical fitness among the female ROTU cadet in NDUM. Based on the seven test batteries, the subject was accessed their level of physical fitness and categorized into five class which were excellent, good, satisfied, less satisfied and need training.

2. Method

The location for this study was at the National Defence University of Malaysia, Kuala Lumpur. With the purposive sampling design, 212 female ROTU cadets were selected as sample. With the retuned consent form, the entire subject went through the first phase of the project, involved pre data collection.

Copyright © 2018 Authors. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The instruments used were the self-administered questionnaire for the demographic characteristic and the necessary tool for the seven battery test (2.4km running, 30m sprint, 10m zigzag running, stand long jump, 60 second push-up, 60 second curl up and sit and reach). The standard size of synthetic track was use for the running exercise while the rest were at the gymnasium. The tests began with 10 minutes warming up instructed by the professional physical instructor. According to Paul Collins, 2009, an effective warm-up plays an important role in improving the performance. The effective warm-up helps to create a positive environment for the whole training session by establishing workable boundaries and focus for training.

In 2.4km running, subjects run 6 rounds on the inside ring of a standard 400m track for an accurate test and measurement. The subject's time was taken individually by the instructor using the stop watch. Each of them was released one by one in order to make gabs and to minimize error in recording time. During the 30 meter sprint, they were given two times sprinting with two minutes rest in between [8]. The fastest time was recorded. Subject began in the standing position and the foot was standing in the starting line. The subject began when the instructor blow the whistle. In this test, the instructor has to make sure that the subject keeps on sprinting on top of the 30 meter's line. The aim of this test is to determine the acceleration and speed in 30 meter [9]. Have to bear in mind that the learning of proper running technique must be performed correctly in order to avoid fatigue.

In another battery test, the 10 meter zigzag was used to test the ability to change the direction quickly. There are an article had proved that the agility is an important quality when attacking [10]. During the exercise, a flat non-slip surface is needed, with 10 by 16 feet rectangle, marked with four cones. Another one more cone was placed at the center of it. At the starting point, subject has to stand at about 30 cm behind the starting line, placing their preferred foot in the forward position in order to trigger the first cone [11]. The instructor gave the command "go" and starts the stop watch. During the running, if the subject make mistake or slipped or touch the cone, subject has to repeat the test. The time stopped when the subject crossed the start/finish line.

The standing long jump also known as, the standing broad jump is a common and easy to administer test of explosive leg power. In this battery test, subject has to place both feet parallel to the line and leap forward. The subject need to squat deeply onto their heels while bringing their arms back. The subject attempts to jump as far as possible, landing on both feet without falling backwards. The clear instruction was given in order to avoid any slipped of injuries during the test. The increasing of loading at the knee during jumping has been previously identified as a possible risk factor for ligament injuries [12]. The total jump distance achieved was considered as the sum of the three component distance which is take-off, flight and landing. The optimum projection angle, maximizes the distance achieve in a standing long jump [13]. Each subject was given two times jumping. The best distance was recorded.

Push-up is one of the traditional functional exercises that have been used to train trunk, arm and shoulder muscular [14]. In this procedure, subject has to stay in plank position with the hands under and slightly outside the shoulder. Then, subject has to lower the body until the chest nearly touches the floor (the gap between the forehead and floor about the size of firm human grip). In 60 second, subject has to repeat the exercise and make count.

The curl up test is to measure the abdominal strength and endurance, which is important in back support and core stability. A flat, clean, cushioned surface was needed to minimize the risk of injuries and for more comfortable condition. Many research has evaluates several abdominal exercises and highlighted the factors which are important for their safety, prescription and effective use [15]. The starting position was lying on the back with knees flexed and the feet cannot be held or rest against any object. With straight arm rested beside thighs, the curls up started with a slow controlled movement. There is no pause in the up or down position until completed 60 second. The count was made based on how many curl up had been completed in 60 second.

The 7th battery test was sit and reaches which measure the flexibility of the lower back and hamstring. This test is important because tightness in this area is implicated in lumbar lordosis, forward pelvic tilt and lower back pain [16-17]. In this test, subject has to place one hand on top of the other and then reach slowly forward and the measurement was taken based on how far the subject has reached.

At the end of the test or training session, subject should undergo a structured of cool-down to return the body to its normal resting condition. By cooling down, it helps to reduce muscle fatigue and soreness due to the production of lactic acid from the muscle [18]. Besides that, it also helps to reduce cramping, tightening and will make the subject feel batter [19]. The ideal cool down structure should be within 10 to 15 minutes which structured by light activity such as jogging forward, sideways or backwards, gentle dynamic starching and static starching.

3. Findings

From the demographic characteristic aspect, the female ROTU cadet came from all 14 states in Malaysia including Kuala Lumpur and Labuan territory. Forty percent of the cadets are 19 years old (n=85) while 31% (n=60) and 29% (n=66) are 21 and 20 years old respectively. Their background showed that they came from different faculties and course in NDUM but unfortunately none of them from sport science background.

The tables showed the result for the physical fitness test in all type of test battery among female ROTU cadet in the pre-test data collection according to age groups. Based on statistics, (SPSS 20.0) the one way Anova showed a significant difference in physical norms for 2.4 running between age group ($p<0.005$). The result also showed that not more than 10 subject in each group are in excellent score. There was also a significant difference in 10m zigzag running and push-up test batteries where $p<0.05$. In overall the pattern showed that the level of physical fitness among the subject according to the seven test batteries were at the mostly good (10m zigzag running, 60 second push-up and 60 second curl-up) and satisfied (2.4km running, 30m spring, sit and reach and stand long jump). There were also a quiet number of subjects who need more training in order to make them more fit.

Individual exercise capacity are varies widely among people even though in similar ages and physical builds. Several study have demonstrated the improvement in cardiovascular condition with endurance exercise period as brief as 5 to 10 minutes a day. However, more research has indicated that the optimal amount that recommended was 20 to 30 minutes per day with appropriate exercise intensity. In terms of endurance training, the physical activities that develop the cardiovascular endurance as well as respiratory are walking, jogging, running, cycling, rowing, aerobic, dancing, box stepping and hiking [20].

For those who need to improve the general health, the research finding has showed that the resistance training is useful. This training can affect the cardiorespiratory fitness, reduce the risk of obesity and also increase the fat-free mass and decrease the fat mass. This condition will improve the fitness level.

Table 1: The physical fitness test based on norms score for the 2.4km test battery (in minutes) according to age groups

Battery test		Age Categories	

2.4km Running	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≤14.01 (8)**1**	≤13.25 (6)	≤13.24 (10)
Good	14.02-16.17 (14)	13.26-15.31 (10)	13.35-15.09 (17)
Satisfied	16.18-18.35 (24)	15.32-17.37 (23)	15.10-16.44 (33)
Less satisfied	18.36-20.12 (29)	17.38-19.43 (17)	16.45-18.19 (4)
Need improvement	≥20.12 (10)	≥19.44 (14)	≥18.20 (2)

Table 2: The physical fitness test based on norms score for the 30 meter sprint test battery (in minutes) according to age groups.

Battery test		Age Categories	
30m Sprint	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≤5.36 (14)	≤5.45 (2)	≤5.52 (1)
Good	5.37-6.07 (6)	5.46-6.29 (14)	5.53-6.19 (18)
Satisfied	6.06-7.18 (35)	6.30-7.13 (21)	6.20-7.26 (32)
Less satisfied	7.19-8.29 (20)	7.14-8.37 (14)	7.27-7.53 (9)
Need improvement	≥8.30 (10)	≥8.38 (9)	≥7.54 (6)

Table 3: The physical fitness test based on norms score for the 10 meter zigzag running test battery (in minutes) according to age groups.

Battery test		Age Categories	
10m Zigzag	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≤7.20 (7)	≤6.88 (10)	≤5.58 (12)
Good	7.21-8.36 (46)	6.89-7.29 (31)	5.59-6.21 (31)
Satisfied	8.37-9.12 (16)	7.30-8.14 (16)	6.22-6.86 (16)
Less satisfied	9.13-9.48 (12)	8.15-9.34 (2)	6.87-7.59 (6)
Need improvement	≥9.49 (4)	≥9.35 (1)	≥7.60 (1)

Table 4: The physical fitness test based on norms score for the standing long jump test battery (in cm) according to age groups.

Battery test		Age Categories	
Standing Long Jump	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≥192 (9)	≥192 (5)	≥200 (6)
Good	191-174 (16)	191-178 (17)	199-178 (22)
Satisfied	173-155 (20)	177-163 (33)	177-164 (31)
Less satisfied	154-135 (36)	162-147 (4)	163-150 (6)
Need improvement	≤134 (4)	≤146 (1)	≤149 (1)

Table 5: The physical fitness test based on norms score for the push up test battery (in 60 second) according to age groups.

Battery test		Age Categories	
Push-up (60second)	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≥78 (18)	≥79 (17)	≥82 (14)
Good	62-77 (24)	70-78 (21)	72-81 (18)
Satisfied	58-61 (17)	61-69 (16)	61-71 (21)
Less satisfied	43-57 (10)	45-60 (4)	46-60 (10)
Need improvement	≤42 (16)	≤44 (2)	≤45 (3)

Table 6: The physical fitness test based on norms score for the sit and reach test battery (in cm) according to age groups

Battery test		Age Categories	
Sit and Reach (cm)	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≥59 (9)	≥61 (4)	≥64 (3)
Good	48-58 (16)	49-60 (14)	49-63 (20)
Satisfied	38-47 (20)	39-48 (22)	40-48 (27)
Less satisfied	28-37 (36)	29-38 16)	32-39 (13)
Need improvement	≤27 (4)	≤28 (4)	≤31 (3)

Table 7: The physical fitness test based on norms score for the curl up test battery (in 60 second) according to age groups.

Battery test		Age Categories	
Curl up (60second)	19 years (n=85)	20 years (n=60)	2 1years (n=66)
Excellent	≥51 (3)	≥58 (1)	≥61 (4)
Good	42-52 (35)	44-57(19)	46-60 (19)
Satisfied	34-41 (17)	31-43 (20)	34-45 (24)
Less satisfied	25-33 (26)	27-30 (16)	29-33 (16)
Need improvement	≤24 (4)	≤26 (4)	≤28 (3)

Forest training and rugged activities are the mandatory activities to be undertaken by ROTU cadet members. It runs on weekends (called as local training) and during semester breaks (as the continuous training) will take about a week. The ROTU physical schedule is compiled by a special officer, assigned to more rugged physical exercise that geared towards military. It is undeniable that the military training and forestry knowledge provided examine the mental and physical resilience of female ROTU cadets.

However, it should be emphasized that, the ability to flex, muscle strength, cardiovascular and so forth should be consistent even without undergoing the military activity. Besides the planned activities, female ROTU cadets are also required to undergo physical activity every day from 5 to 6.30 pm. However this activity is run independently among the cadet members. From the observation and interviews with some of them, they agree that without discipline and self-esteem, will allows them to spend time in the room undergoing their own activities. Therefore, one of the objectives in this study is to produce the fitness manual which can give guidance not only among ROTU women, but can also be implemented by all fitness trainers at UPNM as a daily routine activity.

In the implementation of 7 test batteries, the correct equipment and appropriate to the type of test done is a priority. The selection

of flat synthetics track is more appropriate and precise without hitch and hilly conditions. Up to this level, the observation showed that a detailed description of the procedure in conducting each of the test battery is important. This is because without explanation, there is a lot of probability that the test batteries run are invalid, inaccurate and can cause injury. Planning needs to be done before conducting any physical tests including understanding the test, the procedures, individual referrals and preparation 1. Proper steps to avoid any injury while running, leaping and flexibility of the body also very important. Injuries are extremely avoided amongst members of the army especially in physical activity as it will involve treatment and recovery expenses8.

Overall, almost all subjects undergo the physical activity without being exposed to proper and safe procedures. Pre-test observations also found that there were a smartphones use to take time during run tests and other physical activity during their regular training sessions. Therefore, they should be educate that the use of the stopwatch is the correct method as well as it is accurate and more comfortable. In order to undergoing the correct method of performing physical tests, the subjects also need to know why and for what each test battery is running. The majority of the subjects are unaware that these tests are carried out to test the muscular endurance, flexibility, speed, tenderness, power apart from recording the fastest time for the 2.4km run. Therefore, this exposure is important because, the subject will be more interested and motivated to know the needs of each test run. In the study of Karin W.J. Et. Al., 2015 showed that there is a significant relationship between satisfaction and motivation in physical exercise.

Thus, the recommendations to improve in the types of test battery and the details of the procedures are positively accepted as making fitness training and testing among ROTU cadets especially this woman is more neat and systematic. By conducting this study of fitness norms, the level of knowledge regarding physical fitness among ROTU cadets and the level of fitness training operation will also increase. With a deeper understanding, all planning and training will be better and orderly on the part of the administration's cadet. As stated in the table, the score for those who get excellent in 2.4km running was less than 20% for all age groups. The cardiovascular fitness is very important for this subject because they are the group who need to involve the tough training. Same goes with the 30m sprint result where very less subject excellent in speed.

In the military, we can always find the example in everywhere of the importance of speed in battle. Besides speed, endurance and agility in physical fitness, flexibility is also important in training and everyday life. However, the training to increase the flexibility could be not that simple or not as same as just training for strength or endurance. Stretching is one of the effective ways for flexibility. Flexibility exercises also benefits to prevent injuries, back pain and balance problem. Thus, the manual procedure can help a lot to guide the subject to do the physical exercise and test which will give batter result in their overall performance and health status.

From the discussion, we agreed that the frequency of the participation is an important factor to consider. Research studies conducted on the frequency of exercise recommended 3 to 5 days per week as the optimum frequency for health related benefits. It can be increased up to 5 of more days per week if the activity is enjoyed with physically tolerate20. Thus in order for the subject to maintain their health benefits and physical fitness, 3 days exercise per week with at least 30 minutes per session is recommended. However it is highly recommend mostly to the subjects to practice an exercise at least 5 times or more per week, with minimum 30 minutes per session to increase their physical fitness level. The exercise program that has been scheduled for the subject for the 4 weeks intervention consist of the warm-up, cool-down and stretching activities, endurance training, flexibility training, resistance training and some recreational training.

4. Conclusion

In a positive way, Female ROTU cadets in UPNM should have a standard to reach in physical fitness level for every age of group (19, 20 &21 years). The standard that produced must be based on proper fitness test and reliable. By undergoing the pretest, researcher can assess the extent to which the need to develop physical fitness test based on the seven test batteries for female ROTU cadets in UPNM. These physical fitness tests will help in classifying their fitness levels. Therefore, the results of the study can be used as a reference for future scientific studies especially among the ROTU cadets in Malaysia. In future, when this study has reached the stage of collection and processing of post data, the Fitness Training Manual can be used as a reference and can be applied by the ROTU cadets and trainer throughout the country.

References

[1] Ahmad Hashim. 2015. Pengujian Pengukuran Dan Penilaian Pendidikan Jasmani. Bandar Baru Bangi, Selangor: Dubook Press Sdn Bhd.

[2] 2 Mohar Kassim, Sheikh Kamaruddin Sheikh Ahmad & Baharom Bahari Muda. 2016. Konsep Latihan Dalam Sukan. Ampang, Selangor: Pekan Ilmu Publication Sdn Bhd.

[3] Matti Santtila, Hakkinen Keijo, Karavirta Laura & Kyrolainen Heikki. 2008.Changes in Cardiovascular Performance during an 8-Week Military Basic Training Period Combined with Added Endurance or Strength Training. Military Medicine, 173,12:1173-1178.

[4] Ahmad Hashim & Gunathevan. 2015. 900 Push-Up Test Norms Sport Sport Science Students Sultan Idris Education University. International Journal of Development and Emerging Economics, 3(1):1-9.

[5] Mozumdar A., Lid=guori G. & Baumgarterner T.A. 2010. Revised Push-Up Test Norms for College Students. Measurement in Physical Education and Exercise Science, 14:61-66.

[6] Romain S.B. & Mahar M. T. 2001. Norms-Referenced and Criterion- Referenced Reliability of the Push-Up and Modified Pull-Up. Measurement in Physical Education and Exercise Science, 5(2):67-80.

[7] Baumgartner T.A., Hales D., Chung H, Oh S. & Wood H.M. 2004. Revised Push-Up Test Norms for College Students. Measurement in Physical Education and Exercise Science, 8(2):83-87.

[8] Todd D. Brown, Jason D. Vescovi & Jaci L. VanHeest. 2004. Assement of Linear Sprinting Performance: A theoretical Paradigm. Journal of Sport Science, 3:203-210.

[9] Kumar H. 2006. Age Changes in Speed of Running During 30 meter Print Running. Journal.of Exercise Science and Physiotherapy, 2:92-95.

[10] Mehmet Kultu, Hakan Yapici, Erkan Demirkan & Abdullah Yilmaz. 2014. Reliability and Validity of New Tests on Agility and Skill for Children Soccer Players. Central European Journal of Sport Science and Medicine, 8(2):5-12.

[11] Oliver J.L., Mayers R.W. 2009. Reliability and Generality of measures of Acceleration, Planned Agility and Reactive Agility. International Journal of Sport Physiology and Performance, 4 :345-354.

[12] Ajit M. Chaudhari, Brenna K. Hearn & Thomas P. Andriacchi. 2005. Sport-Dependent Variations in Arm Position During Single-Limb Landing Influence Knee Loading. The American Journal of Sports
cine. .http://www.jornals.sagepub.com/doi/pdf/10.1177/0363546504270455.

[13] Masaki Wakai 7 Nicholas P. Linthorne. 2005. Optimum Take-off Angle in the Standing Long Jump. Human Movement Science, 24:81-96.

[14] Juaquin Calatayud, Sebastien Borreani Juan C. Colado, Fernando Martin F., Micheal E. Rogers, David G. Behm & Lars L. Andersen. 2014. Muscle Activation During Push-Ups With Different Suspen-

sion Training Systems. Journal of Sport science and Medicine, 13:502-510.
[15] C.M.Norris. 1993. Abdominal Muscle Training in Sport. British Journal of Sport Medicine,27(1):19-28.
[16] Daniel Mayorga-Vega, Rafael Merion Marban & Jesus Viciana. 2014. Criterion-Related Validity of Sit-And-Reach Tests for Estimating Hamstring and Lumbar Extensibility: A Meta-Analysis. Journal of Sport Science Medicine, 13:1-14.
[17] Lars Rosendal, Hanning Langberg, Arne Skov-Jensen & Micheal K. 2003. Incidence of Injury and Physical Performance Adaptations During Military Training. Clinical Journal of Sport Medicine, 13:157-163.
[18] Karin W.J., Magnus L. & Andreas I. 2015. Need Satisfaction, Motivational Regulations and Exercise: Moderation and Mediation Effects.
[19] Paul Collins,.2009. The Body Coach, Speed for Sport. Oxfort:Meyer Sport (UK) Ltd.
[20] Jack H. Wilmore & David L. Costill. 2004. Physiology of Sport and Exercise. Third Edition. Human Kinetics, United states.