The Level of Physical Fitness among First Year Female Students in National Defence University of Malaysia

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Abstract. The physical fitness among university students is a basic necessity that is equally important to the needs of education. Thus, it is important to know which level are they in physical fitness. As a student especially among female, are they fit enough to live in multi-tasking exercise in their daily life? In more systematically and accurately, the level of their physical fitness can be measured by implementing the test batteries. The objective of this study was to measure the level of physical fitness and to build the fitness norm among the first year female students at the National Defence University Malaysia (NDUM) Kuala Lumpur, based on seven test batteries. The sampling population were all the NDUM first year students. Those who passed the selection criteria had been selected as subjects who consist of 130 female students from the various demographic backgrounds. The instruments involved the seven 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. Data collection has been conducted in the standard size synthetic track and gymnasium in the university. The subjects had been given a description and physical fitness manual procedures before performing all the physical exercise. The end of the study, the physical fitness level of 130 first year female students at NDUM had been determined based on the seven test batteries. The construction of fitness norms has also been successfully set up. In average, less than 30% of the subjects have an excellent physical fitness. The results of this study can be used as a reference for future scientific studies among university student in Malaysia.

1. Introduction
Optimal physical fitness is important in everyday life. With current developments, modern societies are now less likely to achieve an optimum fitness levels. The equally important to the needs of education, physical fitness among the university students is also need to take into account nowadays. By engaging in fitness activities, it will provide a balance between mental, spiritual, and physical health. As such, the healthy, active and disciplined students will contribute to productivity of the country. The question is, are they physically fit as the youths when they become part of the contribution to the country? Therefore, the level of fitness among students in the university is one of the important bench marks to produce strong candidates in development of the country. Physical fitness performance index is a criterion that has been used in interpreting the level of individual physical fitness. According to Ahmad Hashim 2015, the importance of physical performance measurements is helpful in identifying the strengths and weaknesses of the students in terms of muscle strength, cardiovascular endurance, tenderness, speed, power and so on.
Talking about physically active, many studies have found that female students are less physically active than men. In a study conducted at one of the local learning institute, male students were more active in sports than women. From the observation at the court games in the evening, there were more male students. Female students only seem to play during Physical Education or co-curricular activities. Most of them prefer to stay in dormitory rooms doing review or go for a walk in the campus. The study conducted by Lester et al. 2008, which explores the levels of physical activity participation among 75 young women had examined the gaps between young women who are 'always' and 'never' participating in sport or physical activity. The research concluded that the positive perceptions of their own ability, low self-consciousness, firm motivations and personal choice to engage in activities and the supporting influence of their friends and family was the reason of never participated in sport among the subject. One of the articles from the International Journal of Environmental Research and Public Health had examined the perceived exercise benefits and barriers of 200 non-exercising female universities (mean age 19.3 years). The result showed that they do not engage in sufficient physical activity due to low perceived benefits and high perceived barriers to exercise.

Therefore, the objective of this study is to measure the level of physical fitness and to build the fitness norm among the first year female students at the National Defence University Malaysia based on 7 test batteries. According to Hajimolkan et al. 2014, the level of physical fitness among 64 female trainees aged between 18 and 20 years old has been identified based on five physical fitness tests. The results of this study have enabled researchers to determine the physical fitness performance of each trainee.

2. Methodology
The location for this study was at the National Defense University of Malaysia (NDUM), Kuala Lumpur. Sampling population were all the first year students in NDUM. After went through a selection criteria, the subject consist of 130 female students from various demographic background had been selected. The Inclusion criteria were, first year female civilian students, having no chronic disease, volunteer to participate in the survey and successfully completed all seven battery tests. Based on observations and questionnaires, majority of the subjects were non-athletes and not so active in physical or sports activities.

For data collection, the instruments used were the self-administered questionnaire for the demographic characteristic and the necessary tool for the seven battery test which were 2.4km running, 30m sprint, 10m zigzag running, stand long jump, push-up, curl up and sit and reach. Data collection has been conducted in the track area (for running test) and gymnasium at the university. The physical test started with the subjects was given a description and physical fitness manual that describes the correct procedures in performing all physical routine [6-8].

In 2.4km running, the standard 400m track (which is the 6 rounds on the inside ring) was use for an accurate test and measurement. By using the stop watch, subject's time was taken individually by the instructor immediately after they have completed the 6th lap. Each of them was released one by one in order to make gabs and to minimize error in recording time. For 30 m sprint test, the subject was in a standby position at the starting line. Subject sprinted after the wiser blow by the instructor. A total of 6-8 subjects were released at a time and the run time was recorded respectively by instructors. Each of the sprinters had given two times sprinting with two minutes rest in between [9]. The fastest time was recorded. In order to get the time precisely, the instructor had 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 meters [10]. The third test battery was the 10 meter zigzag to test the ability to change the direction quickly [1]. During this exercise, a flat non-slip surface is needed to place a 10 by 16 feet rectangle, marked with four cones on each angle. Another 5th cone was placed at the center of it.
At the starting point, subject was stand 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 timing concurrently. If the subject slipped or touch the cone during running, test will be repeated. Time was taken when the subject crossed the finish line. Two times chance had been given to them and the best time had been taken. The purpose of standing broad jump is test the leg power. In this battery test, subject has to place both feet parallel to the line and leap forward by squatting onto their heels. The subject attempts to jump as far as possible, landing on both feet without falling backwards. The increasing of loading at the knee during jumping has been previously identified as a possible risk factor for ligament injuries [12]. Thus, clear instruction has been given in order to avoid any slipped or injuries during the test. To measure the flexibility of the lower back and hamstring, sit and reach test had been done. 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. For each of the respective test, the subject was given two times trial with two minutes rest in between [9]. The best result was recorded.

The sixty second banned knee push-up test is to measure the strength of trunk, arm and shoulder muscular [13]. This procedure required the subject to stay in plank position with the hands under and slightly outside the shoulder. Then lower the body until the forehead touches the instructor's hand grip [1]. The curl up test is to measure the abdominal strength and endurance. In order to minimize the risk of injuries and feel more comfortable, a flat clean, cushioned surface was used. Many research has evaluated several abdominal exercises and highlighted the factors which are important for their safety, prescription and effective use [14]. 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.

3. Result and Discussion
The demographic characteristic showed that the subject came from all 14 states in Malaysia including Kuala Lumpur and Labuan territory. Apart from the majority of Malay students, there are Chinese, Indian, Punjab and Iban. They had been offered to further study based on the previous excellent result in Certificate of Higher Education, Diploma and Foundation. They came from different faculties and course in NDUM but unfortunately none of them from sport science background. Table 1 shows the result for the physical fitness norms for the seven battery tests among the first year female student in NDUM.

| Battery test                  | Achievements (total) |        |        |        |        |
|------------------------------|----------------------|--------|--------|--------|--------|
| 2.4 km Run (in minutes)      | Excellent            | ≤12.69 (12) | 12.70-15.92 (24) | 15.93-19.16 (53) | 19.17-22.37 (31) | ≥22.40 (11) |
|                              | Good                 | ≤3.8 (1) | 3.81-5.89 (83) | 5.90-7.07 (21) | 7.08-9.16 (14) | ≥9.17 (11) |
| 30 m Sprint (in second)      | Satisfied            | ≤4.70 (4) | 4.71-5.89 (31) | 5.90-7.07 (58) | 7.08-8.25 (27) | ≥8.26 (10) |
| 10metre Zigzag (in second)   | Average              | ≥179 (13) | 154-178 (22) | 129-153 (62) | 104-128 (24) | ≤103 (9) |
| Stand broad jump (in cm)     | Poor                 | ≥45.0 (10) | 38.0-44.5 (38) | 31.0-37.5 (44) | 24.0-30.5 (28) | ≤23.5 (10) |
| Sit and reach (in cm)        |                      | ≥42 (16) | 32-41 (24) | 22-31 (45) | 13-21 (36) | ≤12 (9) |
| Curj-up (in 60 second)       |                      | ≥38 (16) | 29-37 (22) | 20-28 (55) | 11-19 (24) | ≤10 (13) |
| Push-up (in 60 second)       |                      |        |        |        |        |        |

Table 1: The physical fitness norms for the seven battery tests among the first year female student in NDUM
In average, only 12% from the total 130 subject had been identified as excellent according to the seven battery tests. The pattern has showed that, most of the subjects were in good and satisfied achievements. Thus we can conclude that the need of physical activity in the campus is necessary in order to make the youth generation become active and excellent in physical fitness. Even though in similar ages and physical builds, the individual exercise capacity are varies widely among people. Several studies have demonstrated the improvement in cardiovascular condition with endurance exercise is 5 to 10 minutes per day. Some research has indicated that the optimal amount that recommended was 20 to 30 minutes per day with appropriate exercise intensity. In endurance training, the activities that develop the cardiovascular endurance as well as respiratory are walking, jogging, running, cycling, rowing, aerobic, dancing, box stepping and hiking [15].

Apart from it, the subjects also learned why and for what each battery test was 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. In the study of Karin W.J. Et. Al., 2015 showed that there is a significant relationship between satisfaction and motivation in physical exercise.

In this study, the subjects were given a description and physical fitness manual at the beginning of the session. It described the objectives, correct procedures in performing all the seven test batteries. This is important because without proper explanation and reference, it will invite the risk of injury, error in reading and inaccuracies in physical fitness tests. Accurate quantification of physical activity and physical fitness are essential in terms of health outcome and effectiveness of any intervention programs. He teaches criterion methods, reliability and validation of measurements, describing the objective methods of safety features [7]. Accurate evidence of proper physical activity arrangements is a key component of understanding the cause of injury during sports. A complete description of certain types of injuries, in certain sports can alter and minimize the risk of injury [8]. Darren et al. 2006, revealed that the physical activity guidelines are sufficient to elicit health benefits, especially in previously sedentary people. The relation appeared between physical activity and health status where further increase in physical activity and fitness will lead to additional improvements in health status.

This study also performed the practice of warming up before starting any physical activity. It benefits to heat the body stretch up in order to prepare the muscle and joint. 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. Warm-up was shown has shown that performance improvements can be demonstrated among the sport participants after completion of adequate warm-up activities [19].

4. Conclusion
At the end of the study, the fitness level of 130 first year female students at NDUM was tested using seven test batteries. These physical fitness tests will help in classifying their fitness levels. The construction of fitness norms has also been successfully set up based on seven test batteries. The subject also gets exposure and new knowledge on how to conduct physical fitness test and its importance.

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