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Physical performance in young men at Swiss Army recruitment 1982 to 2005

Abstract

Little is known about the physical fitness profiles of the young Swiss population. The purpose of the present work is to describe the data of the physical performance tests at the compulsory Swiss Army recruitment. The 12-minute running test, the standing long jump, and the five-meter pole-climbing test were continuously part of the physical performance test for more than 20 years. These data show a decrease in aerobic endurance and pole-climbing performance from 1987 to 2002. After 2002 a reversal of trend occurred for the aerobic endurance performance. Muscle fitness, assessed by standing long jump, has not changed. The inconsistent data do not confirm the common opinion of a decreasing general physical fitness level among Swiss men.

Zusammenfassung

Über die körperliche Fitness der Schweizer Bevölkerung ist wenig bekannt. Deshalb werden in der vorliegenden Studie Resultate des körperlichen Leistungstests bei der für Männer obligatorischen Rekrutierung der Schweizer Armee präsentiert. 12-Minuten-Lauf, Standweitsprung und 5-Meter-Stangenklettern waren über mehr als 20 Jahre durchgehend Teil dieser körperlichen Leistungsprüfung. Die Daten zeigen eine Abnahme bei der Ausdauerleistungsfähigkeit und beim Stangenklettern zwischen 1987 und 2002. Nach 2002 trat bei der Ausdauerleistungsfähigkeit eine positive Trendwende ein. Die mittels Standweitsprung bestimmte Muskelkraft hat sich zwischen 1982 und 2005 nicht bedeutend verändert. Die widersprüchlichen Daten belegen die verbreitete Meinung der sinkenden generellen physischen Leistungsfähigkeit der jungen Männer nicht. Für zukünftige Monitoring-Aktivitäten sind individuelle Daten nötig, um die Entwicklung der Leistungsfähigkeit der jungen Schweizer eindeutiger zu erkennen.

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Introduction

Obesity in young people has increased in Switzerland and other Western countries in the last 10–30 years (Blair and Church, 2004; Santtila et al., 2006; Faeh et al., 2008). Actually over 50% of young Swiss citizens are either totally inactive or not active enough, based on the minimal recommendation of at least half an hour of moderate physical activities per day (Lamprecht and Stamm, 2006). However, little is known about the changes in physical fitness in young Swiss citizens. In young Norwegian, Danish, Swedish and Finnish men, a trend of decreased aerobic endurance performance in the last 20 years was observed (Sorensen et al., 1997; Rasmussen et al., 1999; Sharp et al., 2002; Santtila et al., 2006). In young Finnish men also a decrease in muscle fitness in the last 15 years was observed (Santtila et al., 2006).

In the year 1905 a physical performance test was implemented at the recruitment of the Swiss Army. Over time the performance test has been modified frequently. Nevertheless between 1982 and 2005 the 12-minute running test (12-MRT) and the standing long jump (SLJ) were continuously part of the physical performance test battery. The five-meter pole climbing (PC) was included until 2002 only. It is the aim of this study to describe changes in physical performances in young Swiss men over 21–24 years, based on 12-MRT, SLJ and PC results.

Methods

Every year, all 19-year old male Swiss citizens take part in the compulsory Swiss Army recruitment. Physical performance data used

in this study were assessed during the years 1982 to 2005. Until 1987, the Swiss Federal Statistical Office published the aggregated results of only every fifth year. From 1988 on, the Swiss Federal Institute of Sport assumed this task and published the results annually. In those aggregated data sets the numbers of exempted and participating conscripts as well as the mean results of the participating conscripts were given.

The numbers of the exempted and participating conscripts were presented as means and standard deviations. For analysis, the relative attendance in the three disciplines 12-MRT (also referred to as Cooper test (Cooper, 1968)), SLJ (Bosco et al., 1983) and PC were calculated and presented with the respective mean performances. For PC no descriptions were published in a scientific journal. However, this part of the performance test was strictly standardised as well. Only descriptive statistics were used in the present study.

Results

The mean distance in the 12-MRT decreased during the years 1987–2002 constantly from 2601 to 2495 m (–4.1%). During 1982–1987 and after 2002 the 12-minute running distance was constant or even tended to increase (figure 1). The results in the SLJ did not change over the 24 years. After a small increase in distance during 1982–1990 from 2.38 m to 2.43 m (+2.1%) the results were stable until 2000 when they started to decrease slightly from 2.43 m to 2.38 m (–2.1% in 5 years; figure 2). Time in PC increased during 1982–2002 constantly from 4.80 to 5.75 s (+19.8%). Every year 33 140 ± 4252 conscripts attended the recruitment. Therefrom

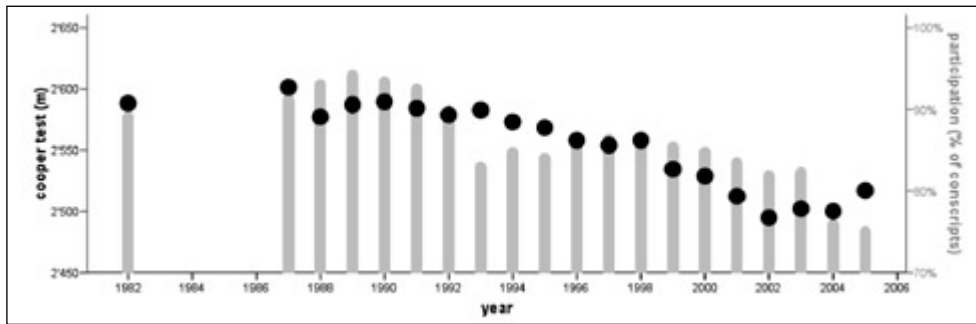


Figure 1: Performance and participation in 12-minute running test (Cooper test) at the compulsory Swiss Army recruitment during the years 1982–2005; dots: distance of the Cooper test, bars: participation

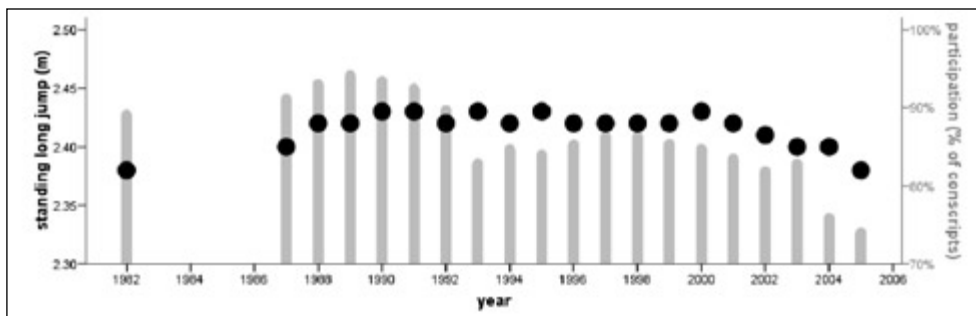


Figure 2: Performance and participation in standing long jump at the compulsory Swiss Army recruitment during the years 1982–2005; dots: distance of the standing long jump, bars: participation

4482 ± 1150 conscripts were excluded from the 12-minute running test, 4491 ± 1593 from the standing long jump and 3524 ± 1742 from pole climbing due to medical reasons. During 1900–1993 and 2003–2004 the percentage of conscripts participating in the performance tests decreased noticeably from 92% to 83% respectively from 82% to 76% (figures 1 and 2, grey columns).

Discussion

The present data show that aerobic performance and pole-climbing performance decreased since 1987 until 2002. After 2002, a change of trend is indicated in the 12-MRT data. Unfortunately no pole-climbing data exists after 2002. Muscle fitness, assessed by SLJ, has not changed between 1982 and 2005.

The decrease in 12-MRT performances could be the result of lower physical activity levels among Swiss adolescents. However, questionnaire data between 1992 and 2002 do not show a relevant decrease in physical activity in Swiss citizens (Lamprecht and Stamm, 2006). Other possible reasons for the decline of 12-MRT and for climbing performances might be the continuous gain in body mass (Faeh et al., 2008) and loss of specific practice at school. The effect of the changing motivation to perform an endurance test in a military setting cannot be determined with the existing data. It is likely that with changing acceptance of the Army in the population motivation for maximal performances at the recruitment has changed as well.

In Switzerland and Finland, changes in 12-MRT values are similar (Santtila et al., 2006). However, in 1982 the aerobic performance of young Finnish men was considerably higher than the one of Swiss men. Therefore the decrease in 12-MRT performance in young Swiss men between 1987 and 2002 was less dramatic than in young Finnish men. Today, aerobic performance of Swiss men tends to be better than those of Finnish men. In Switzerland the trend changed after 2002 from decreasing to increasing 12-MRT performances. This change of trend is not visible in the data of Finnish young men. The increasing 12-MRT performances after 2002 cannot be explained with available data. Only the decrease in participation after 2003 may have influenced the mean performance.

While in the last 15 years a decrease in muscle fitness was observed in young Finnish men (Santtila et al., 2006), in young Swiss men this trend was not confirmed. SLJ performances were stable

until 2000 and decreased slightly thereafter. Physical activity level and motivation had probably a lower impact on SLJ than on the 12-MRT performances.

To a certain extent, muscle fitness was determined by the pole-climbing test too. However pole-climbing performance is strongly related to movement coordination and requires experiences in climbing technique. Therefore it remains unclear if the decrease of climbing performance was related to decreasing muscle fitness or to limited climbing technique. After 2002 the PC was eliminated from the performance test, because climbing poles had been taken down in numerous Swiss schools and the possibilities to instruct male adolescents in the climbing technique were more and more limited.

After changes in recruiting procedures the rate of conscripts exempted from performance tests, due to medical reasons, rose in the years 1993 and 2004. The decrease in participation influenced probably the mean physical performances, based on a selection effect. However, performance values were still comparable with previous measurement data because more than 75% of all 19 years old Swiss men took part in these assessments.

For more sophisticated analyses individual performance data, not only aggregated data, and information about conscripts' motivation would be necessary. Unfortunately these data were not available any more.

After 2005, a new physical performance test battery was established at the recruitment of the Swiss Army. Therefore it will be difficult to continue the monitoring of 12-MRT performances in young Swiss men. However, the new endurance test (a progressive endurance run) may be more appropriate especially for individuals with low fitness level or no experience in self-pacing compared to 12-MRT (Wyss et al., 2007). The new test battery measures aerobic endurance (progressive endurance run), explosive muscle power (seated 2-kg-shot put and standing long jump), trunk muscle fitness (trunk muscle strength test) and balance (one-leg standing test). Additionally daily physical activity level, body weight and height of all conscripts are assessed.

Aerobic endurance performances and pole-climbing performances decreased since 1987 until 2002, while SLJ performances were stable. The inconsistent data do not prove the common opinion of a decreasing general physical fitness level among young Swiss men over the last decades. However, for future monitoring activities individual performance data are needed to better understand the physical fitness profiles among young Swiss men.

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References

- Blair S.N., Church T.S. (2004): The fitness, obesity, and health equation: is physical activity the common denominator? *JAMA*. 292: 1232–1234.
- Bosco C., Luhtanen P., Komi P.V. (1983): A simple method for measurement of mechanical power in jumping. *Eur. J. Appl. Physiol. Occup. Physiol.* 50: 273–282.
- Cooper K.H. (1968): A means of assessing maximal oxygen intake. Correlation between field and treadmill testing. *JAMA*. 203: 201–204.
- Faeh D., Marques-Vidal P., Chiolerio A., Bopp M. (2008): Obesity in Switzerland: do estimates depend on how body mass index has been assessed?. *Swiss Med. Wkly.* 138: 204–210.
- Lamprecht M., Stamm H. (2006): Bewegung, Sport, Gesundheit. Fakten und Trends aus den Schweizerischen Gesundheitsbefragungen 1992, 1997 und 2002. Statsanté. Resultate zu den Gesundheitsstatistiken in der Schweiz. Bundesamt für Statistik, Neuchâtel.
- Rasmussen F., Johansson M., Hansen H.A. (1999): Trends in overweight and obesity among 18-year-old males in Sweden between 1971 and 1995. *Acta Paediatr.* 88: 431–437.
- Santtila M., Kyrolainen H., Vasankari T., Tiainen S., Palavalin K., Hakkinen A., Hakkinen K. (2006): Physical fitness profiles in young Finnish men during the years 1975–2004. *Med. Sci. Sports Exerc.* 38: 1990–1994.
- Sharp M.A., Patton J.F., Knapik J.J., Hauret K., Mello R.P., Frykman P.N. (2002): Comparison of the physical fitness of men and women entering the U.S. Army: 1978–1998. *Med. Sci. Sports Exerc.* 34: 356–363.
- Sorensen H.T., Sabroe S., Gillman M., Rothman K.J., Madsen K.M., Fischer P., Sorensen T.I.A. (1997): Continued increase in prevalence of obesity in Danish young men. *Int. J. Obes. Relat. Metab. Disord.* 21: 712–714.
- Wyss T., Marti B., Rossi S., Kohler U., Mäder U. (2007): Assembling and verification of a fitness test battery for the recruitment of the Swiss Army and nation-wide use. *Schweiz. Z. Sportmed. Sporttraumat.* 55: 126–131.