

NEW PERSPECTIVES AND CHALLENGES: SPORT PERFORMANCE OF MIDDLE AGE AND ELDERLY WOMEN

Teresa Socha

Department of Individual Sports, Academy of Physical Education, Katowice, Poland

Abstract

Introduction. Through most of the XX century women participation in sport was considerably restricted. The strongest restrictions considered the variety of endurance sports due to beliefs that endurance efforts are of particular threat to woman's health, especially to maternal functions.

Materials and methods. In the study it was assumed that at the present level of knowledge, the fullest and most objective criterion for the assessment of possibilities of a human body subjected to intensive and long-lasting sport effort is the level of achieved results. Therefore, the basic material used in the study is information about women's age and the level of women's results in endurance sports.

Results. While the analysis of results achieved by women do not give sufficient basis for establishing optimal age limits from which individual sports, including endurance sports, can be taken up, it brings into the light previously unknown potential of women to achieve good sports results in long-lasting efforts both in their forties and later decades of life (even in their seventies).

Conclusions. The presented results have a important cognitive value. Along with a significant contribution to the theory of sport training the results also provide a new perspective to a more general issue of the role of physical activity involving endurance efforts in preserving health of middle-age and elderly women, in particular in fighting obesity and illnesses related to it.

Key words: endurance sports, women health, middle-age, elderly

Introduction

Through out the ages women participation in sport was considerably restricted mainly for the reason of general beliefs in fragility of female organism influencing sport culture which in due course was characterized by prevailing role of men. The strongest restrictions considered the variety of endurance sports. Through most of the XX century it was believed that endurance efforts are of particular threat to woman's health, especially to maternal functions. Until the 80s of the last century women participation in such sport discipline as a very popular marathon run was officially either banned or subject to age limits. In the Olympic Games program women's marathon run was held for the first time as recently as 1984. However, endurance sports, including marathon, have been practiced by women, also long before the restrictions disappeared, and analysis of excellent results achieved in endurance efforts by both very young girls and older women continuously reveal unknown abilities of female body (1-3). Nevertheless, the present state of knowledge seems to be still insufficient to eventually reject all the concerns about the risks posed to women's health, mainly their maternal functions, by undertaking endurance sports at the developmental age (4). Irrespective of such limitations, the research undertaken due to the continuous need for rationalisation of women sport training has brought into the light previously unknown potential of women to achieve

excellent results in endurance sports during late decades of life [even in their seventies] (5,6).

Materials and methods

The basic material used in the study is information about women's age and the level of women's results in endurance sports. It was assumed in the study that at the present level of knowledge, the fullest and most objective criterion for the assessment of possibilities of a human body subjected to intensive and long-lasting sport effort is the level of achieved results (7). An endurance sport most frequently undertaken by women is a marathon. Every year about 1200 marathons are organised in various parts of the world in which over one million women take part. Thanks to such good attendance in this most representative competition for endurance effort it was possible to gather extensive empirical material relating to the age of women undertaking endurance sports – results updated on the 17th of April 2006. Apart from classical marathons women perform in various ultra-marathons and ultra-runs, in consequence the study presents also results achieved by women in 48-hour race during the 2001 Indoor World Cup, Brno in Czech Republic. Following, the paper presents a few facts about women's extraordinary achievements in such long-lasting endurance efforts as ultra-triathlons.

Results and discussion

Women display amazing possibilities of endurance effort in later decades of their lives. Even at the age of 40

Table 1. Differences between the best marathon results achieved by women aged 40y–50y and women marathon world records of a corresponding year

AGE	NAME, RESULT (H/MIN/SEC), YEAR	THE YEAR WORLD RECORD	Δt [%]
40y	F. Sultanova (RUS) 2:27 :58 (Apr. 2002)	C. N'dereba (KEN) 2:18:47 (Oct. 2001)	6.0%
41y	I. Bogacheva (KGZ) 2:28:06 (Apr. 2003)	P. Radcliffe (ENG) 2:15:25 (Apr. 2003)	8,6%
42y	P. Welch (ENG) 2:26:51 (May 1987)	I. Kristiansen (NOR) 2:21:06 (Apr. 1985)	3.9%
43y	T. Pozdniakova (UKR) 2:29:25 (Oct. 1998)	T. Lorupe (KEN) 2:20:47 (Apr. 1998)	6.0%
44y	J. Smith (ENG) 2:29:43 (May 1982)	G. Waitz (NOR) 2:25:42 (Oct. 1980)	3.0%
45y	J. Smith (ENG) 2:34:27 (Aug. 1983)	J. Benoit (USA) 2:22:43 (Apr. 1983)	8.0%
46y	T. Pozdniakova (UKR) 2:30:26 (Mar. 2002)	C. N'dereba (KEN) 2:18:47 (Oct. 2001)	8.0%
47y	T. Pozdniakova (UKR) 2:28:59 (Oct. 2002)	P. Radcliffe (ENG) 2:17:18 (Aug. 2002)	8.0%
48y	T. Pozdniakova (UKR) 2:34:56a (Jun. 2003)	P. Radcliffe (ENG) 2:15:25 (Apr. 2003)	12.1%
49y	T. Pozdniakova (UKR) 2:30:17 (Mar. 2004)	P. Radcliffe (ENG) 2:15:25 (Apr. 2003)	10.0%
50y	T. Pozdniakova (UKR) 2:31:05 (Mar. 1987)	P. Radcliffe (ENG) 2:15:25 (Apr. 2003)	10.0%

a – point to point course

Source: author's own materials. Last updated on 17 April 2006.

Table 2. World single records – marathon – women aged 70y – 90y

AGE	RESULT (H/MIN/SEC)	NAME
70y 315d	3 : 56 : 10 – 20 Mar. 2005	Miyo Ishigami (JAP)
71y 1d	3 : 48 : 14 – 03 Oct 1993	Pat Trickett (ENG)
72y 226d	3 : 46 : 03 – 26 Mar 2006	Ginette Bedard (USA)
73y 322d	4 : 53 : 03 – 26 Mar 2006	Heidi Muckle-Gader (CAN)
74y 349d	4 : 48 : 35 – 28 Sep. 1980	Ida Mintz (USA)
75y 339d	4 : 08 : 54 – 27 Oct. 2003	Betty Jean McHugh (CAN)
76y 29d	4 : 49 : 08 – 20 Oct. 1985	Anne Clarke (USA)
77y 176d	4 : 11 : 28 – 01 May 2005	Betty Jean McHugh (CAN)
78y 1d	5 : 00 : 37 – 16 Oct. 1983	Ida Mintz (USA)
79y 6d	5 : 03 : 54 – 21 Oct. 1984	Ida Mintz (USA)
80y 5d	5 : 10 : 04 – 20 Oct. 1985	Ida Mintz (USA)
80y 11d	4 : 31 : 42a – 8 Dec. 2002	Helen Klein (USA)
81y 37d	5 : 51 : 10 – 28 Oct. 1990	Anne Clarke (USA)
82y 364d	6 : 13 : 48 – 01 Apr. 1990	Mavis Lindggren (USA)
83y 181d	6 : 33 : 25 – 30 Sep. 1990	Mavis Lindggren (USA)
83y 7d	5 : 10 : 07a – 04 Dec. 2005	Helen Klein (USA)
84y 14d	6 : 02 : 03 – 29 Oct. 1989	Ida Mintz (USA)
85y 13d	6 : 53 : 50 – 28 Oct. 1990	Ida Mintz (USA)
86y 177d	7 : 57 : 24 – 26 Sep. 1993	Mavis Lindggren (USA)
87y 183d	7 : 06 : 48 – 02 Oct. 1994	Mavis Lindggren (USA)
88y 182d	8 : 03 : 24 – 01 Oct. 1995	Mavis Lindggren (USA)
90y 144d	11 : 34 : 00 – 14 Apr. 2002	Janny Wood-Allen (SCO)

y-years, d-days, a – point to point course

Source: autor's own materials - last updated on 17 April 2006.

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they achieve good results in marathon. This is confirmed by the results of 30 best female participants of the London 2003 marathon, among whom three were over 40 years of age, including one 47-year-old. Tab. 1 presents marathon records set by 40 to 50 years old women. The record results have been compared to the officially acknowledged women marathon world records of a corresponding years. Subsequently, the chart also present difference between the two groups of results stated in percentage terms. In the end, it is apparent that marathon times of women aged over 40 do not significantly differ from the magnificent women

world record times, that have already exceeded the commonly believed “human speed limits” and are consistently coming up to the men marathon world records.

Correspondingly, women successfully participate in numerous marathon runs at the age of 70 -90 years. Table 2 presents world single marathon records set by women aged 70-90.

Another unique property of women's bodies which is displayed in later decades of life is the ability to undertake frequent endurance efforts. Take the example of a 42-year-old woman, who took part in 52 mara-

thons in one year, and ran 100 marathons within one year 11 months and 9 days. Along with the classical marathon runs also much longer ultra-marathons or ultra-runs undertaken by women more and more often reveal previously rejected functional possibilities of women's bodies, especially of 50-60 years old women. One of many examples effectively illustrating this phenomenon is the age of six best female participants of the 2001 Indoor World Cup in 48-hour race, in Brno, Czech Republic. An average age of the participants of this unusual effort was 52 years and two of them were 61 and 62 years of age – table 3. This was confirmed by the first victory of a 52-year-old women over men in such an extremely long effort. The winner ran the distance of 361.069 km, 1.250 km more than the best man. It should also be added that a 62-year-old woman ran a longer distance (270.839 km) than most of much younger men (6).

Table 3. Age and results of female participants of the 48-hour race during the 2001 Indoor World Cup, Brno, Czech Republic

RANK	PARTICIPANT	AGE (years)	RESULT (km)
1	Irina Reytovich (RUS)	52 y	361.069
2	Irina Koval (RUS)	43 y	324.749
3	Barbara Szlachetka (POL)	45 y	315.948
4	Else Bayer (GER)	62 y	270.893
5	Sigrid Eichner (GER)	61 y	235.923
6	Irena Lasota (POL)	50 y	232.582

Average age of the six best women – 52 years
Source: author's own materials.

Furthermore, it is also worth noticing that women aged of 40-50 years are a very numerous group among the bests participants (including men) of such heavy endurance efforts as various triathlon competitions, beginning from Olympic triathlon (known also as "international distance" or "standard course" – 1.5 km swimming, 40 km cycling, 10 km run), through long distance triathlon (4 km swimming, 120 km cycling, 30 km run), Ironman triathlons (3.8 km swimming, 180 km cycling, 42.195 km marathon run) as well as diverse multiple Ironman triathlons, such as double, triple, quadruple, quintuple, deca and 15× Ironman triathlon. The idea behind the Ironman triathlons was the debate, dated back to late 1970s, between the participants of traditional running race held in Oahu, one of the Hawaiian islands, about which athletes are more fit: runners, swimmers or cyclists. In 1978 the decision was taken that the debate should be settled through a race combining the three existing long-distance competitions hold on the island. The Ironman triathlon is said to be a grueling event that pushes its

participants to the limits of endurance. Moreover, events such as the double Iron triathlon have evolved along with even more extreme formats; triple, quadruple, quintuple, deca, and 15× events that are multiples of the original Ironman distance triathlon. However, most underlined shall be the fact that the "Ironman" debate about the most able-bodied athlete has been so far brought to the end by a middle-aged woman (8). A German endurance female athlete Astrid Benöhr (born in 1957) is a multiple world champion and world record holder in various multiple Ironman triathlon. In 1997 at the age of 40 she set a world record in the quintuple (five-fold) Ironman triathlon of 74 h and 1 min. (19 km swimming, 900 km cycling, 210 km running) which is over 2 hours less than the men's world record. Following, in 1999, at the age of 42 she set another world record in the deca (ten-fold) Ironman triathlon of 187 h 18 min 37 sec (38 km swimming, 1800 km cycling, 420 km running) which is 4 h 49 min and 49 sec less than the men's world record. In this event, her total time of 187 h included about (only) 8.5 hours of sleep. In 2001, at age 44, she became world champion in the triple Ironman triathlon, finishing before the male world champion. From 1987 to 2002 Astrid Benöhr completed the distance of 139 Ironman triathlons and she is still competing approaching her six decade of life.

At present, among the best triathlonists there are also women aged 60+, represented by an American athlete Angelika Castaneda, a 1992 (at the age of 49) world record holder in triple Ironman triathlon. Tables 4 and 5 present women world records in triple, five-fold and deca Ironman Triathlons and record holders age.

Table 4. Women age and world records in triple ironman triathlon

DATE, EVENT	NAME, NATIONALITY	RECORD (H/MIN/SEC)	AGE (YEARS)
1992, Le Fontanil (FRA)	Angelika Castaneda (USA)	46:30:48	49 y
1992, Lensahn (GER)	Astrid Benöhr (GER)	39:51:05	35 y
1994, Lensahn (GER)	Astrid Benöhr (GER)	38:32:18	37 y
1995, Lensahn (GER)	Astrid Benöhr (GER)	38:09:29	38 y
1996, Lensahn (GER)	Astrid Benöhr (GER)	37:54:54	39 y

Table 5. Women age and world records in five-fold and deca ironman triathlons

DATE, EVENT	NAME, NATION- ALITY	RECORD (H/MIN/ SEC)	AGE (YEARS)
Five-fold Ironman Triathlon			
1994, Den Haag (HOL)	Astrid Benöhr (GER)	86:44:37	37 y
1997, Terpen (GER)	Astrid Benöhr (GER)	74:01:00 absolute world record	40 y
Deca Ironman Triathlon			
1999, Luckau (GER)	Astrid Benöhr (GER)	187:18:37 absolute world record	42 y

Until recently it was believed that shortage of oxygen at the altitude of 8000 m is a deadly threat for a human body, in particular for a woman's body (9). Modern Himalayan climbing, with more and more popular participation of women who climbed a few over-eight-thousand meter peaks (Wanda Rutkiewicz climbed eight of them), does not confirm this. Furthermore, it also shows that most of the top female Himalayan climbers belong to the age group of 40-50. The fact has a significant cognitive value not only for the theory of sport training as it also gives a new perspective on the role of physical activity involving endurance efforts in preserving health of middle-age and elderly women, in particular in fighting obesity and illnesses related to it.

Conclusions

The attempt to give an exhaustive answer seems premature as the period in which women have undertaken such efforts is still relatively short and its scope limited. But even this fragmented information on individual achievements may be a significant ad-

dition to the current state of knowledge in sciences dealing with the recognition of the properties of human body and the knowledge which is included in the theory of sports training. For science the analysis of achievements in endurance sports which allows for discovery of previously unknown functional properties of women is a new opportunity of extending the knowledge on women's bodies and a serious scientific challenge.

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Address for correspondence:

Teresa Socha

Department of Individual Sports

Academy of Physical Education,

Mikołowska 72A

40-519 Katowice, Poland

E-mail: t.socha@awf.katowice.pl

Author's contribution

A – Study Design

B – Data Collection

C – Statistical Analysis

D – Data Interpretation

E – Manuscript Preparation

F – Literature Search

G – Funds Collection