

The Sony Ericsson WTA Tour Ten-Year Age Eligibility and Professional Development Review

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ABSTRACT

Concerns have long existed over the participation of adolescent athletes in the world of professional sports. In 2004, the Sony Ericsson WTA Tour (WTA Tour) commissioned a Professional Development Advisory Panel (PDAP) to evaluate the Tour's Age Eligibility Rule (AER) and Professional Development Programs (PDP) for female tennis players since their inception in 1995. More than 75% of the 628 respondents supported the principles of the AER and 90% indicated a need for PDP. Statistical analysis of WTA Tour players' careers found premature retirements (players leaving the Tour at or before age 21) decreased significantly from 7% pre-AER to less than 1% afterward, and players' career length increased by 43%. The PDAP recommends the WTA Tour continue a phased-in, developmentally appropriate AER, enhance the PDP, and work with other sport-governing bodies to coordinate rules and programs at earlier ages to aid the transition of adolescents into adult sports.

INTRODUCTION

Existing literature documents the negative medical, psychological and developmental effects on young athletes competing in professional sports^{1 2 3 4}. To decrease risks many sport-governing bodies have enacted age limits and invested in professional development programs for athletes and their advisors. The WTA Tour's 1994 AER allowed for a player's amount of tournament play to be increased according to her age and performance capabilities. In 2004, on the ten-year anniversary of its original Age Eligibility Rule Review, the WTA Tour launched what is believed to be the most comprehensive review ever undertaken in any sport regarding age-related developmental programs and age eligibility rules. The WTA Tour empanelled the PDAP, an independent, volunteer body of seven international sports science and medicine professionals, to conduct a comprehensive review and make recommendations. The PDAP had annually reviewed the PDP and the AER since their inception in 1995. The ten-year review was intended to be more extensive, scientifically studying data, trends and program results over time. Independent statisticians and professionals were commissioned to assist with the survey design and data analyses.

METHODS

The Ten-Year Age Eligibility Review used four components: literature review, surveys, oral testimony, and statistical analysis of players' careers. A formal literature review about adolescent participation in elite sports was commissioned from an independent researcher. Standardized surveys were given confidentially to current and former WTA Tour players, members of professional and junior tennis communities (coaches, parents, agents, sponsors, officials and media) and sports science and medicine professionals. The 16-item survey instrument contained questions about the AER and its components, the major stressors encountered by players, and the effectiveness of the PDP. These were anonymously returned to and analyzed by statisticians. The PDAP received direct oral testimony from 30 top current and former professional players, parents, coaches and media representatives who appeared before the PDAP. A statistical analysis of players' careers before and after the 1995 AER was conducted.

RESULTS

Literature Review

A comprehensive literature review was conducted to determine if there was any research evaluating the growth and development and injury rates of young female tennis players. A systematic search over the previous 15 years through PubMed/Medline, Ovid, and SPORTDiscus did not find any specific study to answer the questions. Thirty-six relevant review articles related to the topics were assessed. The literature review concluded that there are physiological risks associated with adolescent growth and development in young athletes who train and compete at elite levels^{5 6 7}. These risks are exacerbated by lack of coaching education, conditioning and training errors, inadequate preparticipation physical examinations, and parents and coaches who drive young athletes too hard and/or fail to provide adequate psychological support^{8 9 10}. The results of these factors include injury^{11 12 13}, burnout and dropout^{14 15}. There is an increased risk of female athlete triad (disordered eating, menstrual disorders and impaired bone mineralization)^{16 17} in women athletes pressured to be unrealistically thin or over-trained and undernourished. Although psychological benefits exist in sports participation, there are also psychological risks. These are associated with many factors including competition, stressors, expectations, loneliness, and training loads.

Survey Results

Six hundred and twenty-eight individuals completed the surveys. Response rates were 72% (226/315) for WTA Tour players, 67% (259/386) from WTA Tour tennis community and 69% (81/117) from international sports science and medicine professionals. Fewer responses were received from the junior tennis community (26%, 50/199) and junior players (11%, 12/110) and that data is not included in this review.

Support for the Age Eligibility Rule

WTA Tour players and members of the professional tennis and sports medicine and science communities strongly support the principles underlying the WTA Tour’s Age Eligibility Rule. In particular, respondents agreed that the amount and level of professional play by girls under 18 should be limited. Ninety percent of the sports medicine and science professionals, 85% of the tennis community and 72.4% of the 224 WTA Tour players favored limitations on the number and level of tournaments for young players. Over 90% of retired WTA Tour players and 68% of players currently governed by the AER favored age restrictions because it allows player growth and development and/or protects players from burnout and injuries. Additionally, 87% of the tennis community and 83% of players favored the WTA Tour’s phased-in approach to professional play, which gradually increases the number of tournaments each year that a player under 18 can play.

The Stressors in Professional Tennis

In 2004, all respondents ranked 25 different stressors on a 1 to 5 Likert scale from “not at all stressful” to “very stressful”. Injuries and expectations are among the top five stressors across all groups, with injuries the top stressor, rated between 3.6 and 4.5. The WTA Tour players’ top five stressors are intrinsic performance-based factors, including injuries, travel, length of season, expectations and competition. Of those players who cited expectations as a stressor, over half said meeting self-expectations was stressful, and fewer commented on parental expectations. When surveyed during the first review in 1994, players identified their top stressors as external factors such as media, loneliness and family. A list of the top five stressors from 1994 and 2004 as nominated by the players is in Table One

Table One: Players’ Stressors in Women’s Professional Tennis

Player Stressors 1994	Player Stressors 2004
Media	Injuries
Parents and Family	Travel
Travel	Length of Season
Competition	Expectations
Loneliness	Competition

Support for the Professional Development Programs

Adolescents competing in professional sports need a broad skill set to survive and thrive in this environment. The PDP were designed to enhance the sports science and medicine support systems for the players, and to address the stressors they identified (see Table One). PDP have been researched, developed and implemented in stages since 1995. The 2004 review allowed the program recipients to assess the need and effectiveness of the PDP. The tennis community and the WTA Tour players overwhelmingly support the programs. Ninety-one percent of the tennis community and 89% of the players indicated a need for the WTA Tour’s PDP and over 85% of both groups felt the WTA Tour should provide programs for young players. The top programs cited by the players in order of their effectiveness are: sports science and medicine services, media training, athlete assistance, physical examination, and career development. These programs are designed to operate cohesively and provide players with the opportunity to acquire the skills they need. The appendix contains details of the programs

Analysis of WTA Tour Players’ Careers

Concerns exist that athletes who enter professional sports at the youngest ages have shortened careers and leave the sport prematurely. The WTA Tour implemented the AER and PDP beginning in 1995 specifically to address those concerns. In 2004 the WTA Tour commissioned independent statisticians to analyze the careers of players.

Comparison of career characteristics between 1993 and 2004

Data from the top 225 ranked WTA Tour players was compared between 1993 (pre-AER) and 2004 (post-AER). Players in the post-AER era are making their professional debuts earlier than pre-AER and the average age of WTA Tour players is older. In 2004, the average age players turned professional is younger by half a year to a

full year compared to 1993 pre-AER, depending on the specific ranking level. Specifically, players ranked in the top-100 turned pro at an average age of 15.2 years post-AER, compared to 16.1 years pre-AER. Similar comparisons can be made at every ranking level from top-10 to top-225. Additionally, the average age of the top 225 players in 2004 is almost a year older than the average age in 1993, (23.3 years vs. 22.5 years). Since the 1995, post-AER players are achieving their highest rankings at approximately the same age or slightly earlier than similarly ranked players pre-AER. Players in the present era are playing about 1.5 tournaments a year more than before the AER was introduced (14.6 to 12.9).

Premature Retirement

Since the 1995 implementation of the AER and PDP, premature retirements (players leaving the Tour at or before age 21) have dramatically decreased. Independent statisticians analyzed careers of all 527 WTA Tour players who began tournament play under age 18 and reached the top 150 in singles ranking from 1970-2004. Of the 527 players, 412 started pre-AER (1970-1994) and 115 post-AER (1995-2004). There was a statistically significant ($p=0.010$) reduction of premature retirements from 7% (29 premature retirements/412 players) pre-AER to less than 1% (1 premature retirement/115 players) post-AER.

Career Longevity

Statisticians evaluated career longevity of WTA Tour players before and after 1995 AER. Career lengths for retired players are completely observable while those still active in 2004 are only partially observable or "censored". The high prevalence of censored data presented an obvious challenge to the analysis. The statisticians analyzed the censored data using survival models known as proportional hazards model constructed to estimate career length in the presence of censored data.

Table Two: Median WTA Tour Career Length Pre-AER and Post-AER

Age Turned Pro	Playing Status	Pre-AER (On 12/31/1994)		Post-AER (On 04/10/2004)	
		Player Count	Median Years Active Pro	Player Count	Median Years Active Pro
≤ 14	retired	33	4.9	1	2.6
	active	49	3.2	43	6.5
	total	82	4.2	44	6.5
15	retired	55	5.7	2	6.8
	active	40	3.2	39	6.5
	total	95	4.7	41	6.5
16	retired	47	6.3	1	6.4
	active	28	2.7	20	6.4
	total	75	5.4	21	6.4
17	retired	13	5.3	2	6.1
	active	12	3.9	7	5.9
	total	25	4.5	9	6
All Ages	retired	148	5.8	6	6.1
	active	129	3.2	109	6.5
	total	277	4.7	115	6.4

The analysis of censored data was approached three ways. The first approach, reflected in Table Two, compared all 392 players who earned rankings in the top 150 at any time during the nine-year period 1986-1994 (277 pre-AER players) with all players who earned top-150 rankings at any time during the nine-year period 1995-2004 (115 post-AER players).

This approach compares both groups over nine-year observation periods and thus provides a plausible way of estimating the AER effect via the ratio of median career lengths. The results show a positive post-AER effect: median career lengths increased by 36%, from 4.7 years in the pre-AER period to 6.4 years in the post-AER. Although the results suggest a positive post-AER effect, this simple approach is inappropriate for estimating career lengths themselves because incomplete and complete careers are treated on an equal basis and the former tend to be much shorter than the latter.

The second approach used a single predictor proportional hazard survival model designed to estimate true career lengths in the presence of censored data^{18 19}. The results from these survival models again show a positive AER effect: increased median career length by 43%, from 11.9 to 17 years (p=0.034) unadjusted for trend (Table Three).

Table Three: Median Career Length and Probability of Ten-year Career or Longer

Method	Group	Median Career Length	Probability of Ten-Year Career or Longer
Unadjusted and Not Modeled	Pre-AER	4.7	
	Post-AER	6.4	
Unadjusted Modeled	Pre-AER	11.9	64%
	Post-AER	17.0	83%
Adjusted Modeled	Pre-AER	12.4	66%
	Post-AER	15.4	79%

The single predictor model assumes the 1995 AER was the only factor affecting career longevity. A third, and most appropriate approach, used a proportional hazard survival model adjusting for factors additional other than AER. Career lengths may have increased during the years 1970-2004 for factors additional to AER, possibly related to changing trends in social and medical conditions (e.g. increase of women in sport, improvements in sports medicine, increased prize money). The effect of AER was again positive: after adjusting for the factors additional to AER, median career length increased by 24% post-AER from 12.4 years to 15.4 years (p=0.181) (Table Three).

The effect of AER can be measured in other ways off the survival curves in Figure 1 (unadjusted for trend) and Figure 2 (adjusted). The curves show the probability of career lengths of a given duration for the pre-AER (lower curve) and post-AER groups (higher curves), respectively. Horizontal differences indicate the effect on percentiles; the effect on the median (50th percentile: median) was an increase from 12.4 years to 15.4 years, while the probability of a ten-year career (or longer) increased from 66% to 79%, an increase of 20% post-AER (Table Three).

Fig 1. AER Survival Curves (unadjusted)

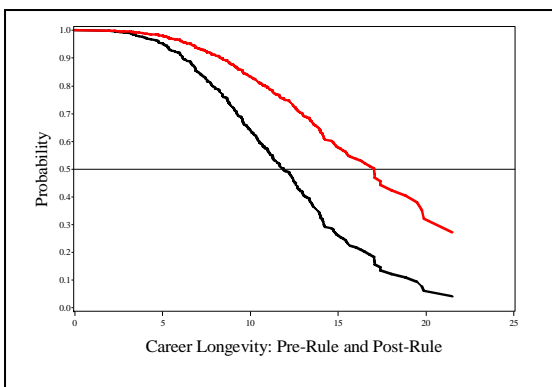


Fig 2. AER Survival Curves (adjusted)



To summarize, career longevity analysis shows that since 1995 professional women’s tennis playing careers are lasting at least 43% longer due to a combination of factors. Roughly half of this 43% increase (the 24% increase in career longevity since 1995) appears to be due to the effect of AER. Premature retirements have decreased from 7% pre-AER to less than 1% post-AER. The average age of players has increased and players are turning professional at younger ages. Additionally, since implementation of the AER in 1995, a WTA professional tennis player now has a 20% greater chance of enjoying a 10-year career.

Recommendations

The PDAP came to unanimous consensus on recommendations to the WTA Tour. Based on the strength and success of the AER and PDP, the WTA Tour should continue the merit-based, phased-in AER providing for each athlete to earn her way into professional tennis at a developmentally appropriate pace in keeping with her level of play. PDP should be expanded to provide all players, especially the youngest, with a solid foundation

for dealing with the challenges of professional sports. Young tennis players compete on the WTA Tour, ITF Women's Circuit, ITF Juniors Circuit, and in the Grand Slams and national competitions. In order to provide a healthy and supportive environment for players, all governing bodies of tennis should cooperate to implement professional development and educational programs to young players and their teams. Programming and outreach are especially important for those young players who are not reached by the WTA Tour initiatives. The WTA Tour should work closely with the ITF, junior circuits, and Grand Slams toward the goal of coordinating or combining rules and conducting further studies concerning all Junior and professional tournaments and amount of training and play.

Conclusions

The PDAP concluded that the AER and PDP have eased the transition of younger players into the WTA Tour while at the same time enhancing their career longevity and decreasing premature retirement. Since the 1994 AER, WTA Tour players are turning professional at younger ages, have longer careers and fewer are leaving the game at or before age 21. Current and former WTA Tour players support the principles of the AER phased-in approach to play for players under 18. The PDP are recognized as effective at dealing with the known stressors in professional tennis with initiatives such as the annual sport-specific physicals, enhanced Sport Sciences and Medicine services, proactive coach, player, parent and agent education initiatives, athlete assistance, mentor program media training and guidance on proper training, periodization, and injury prevention and rehabilitation.

The WTA Tour's professional development approach is innovative within the sports community, providing experiences, skills, abilities and tools to help athletes prepare for and handle the physical and psychological demands of professional tennis. The PDP and AER combined are helping create a new generation of athlete with the opportunity for a longer career, and with skills to mitigate external factors (family, media) to focus more on important performance factors (expectations, injuries) that maximize career potential.

Appendix: Sony Ericsson WTA Tour Professional Development Programs

- **Sport Sciences & Medicine:** Professional staff travel with players and provide comprehensive evaluation, treatment, and rehabilitation. They also assist players with health problems when they are off the Tour.
- **Media Training:** Players learn how to be prepared, professional and self-expressive in front of the media, during interviews and representing themselves on- and off-the-court.
- **Athlete Assistance:** Players are provided with educational and preventative strategies for enhancing on-court performance and coping with challenges of professional tennis. Assistance is accessed through Physically Speaking (a newsletter), a twenty-four hour confidential Athlete Assistance phone service and website, individual referral services, and on-site Sport Sciences & Medicine and Professional Development teams. Athlete Assistance proactively addresses the entire gamut of stressors that players may experience from the common, winning and losing, to the most serious and debilitating conditions.
- **Physical Examination:** Players are required to have annual sport-specific and performance-based examinations.
- **Career Development:** Players utilize this program to identify their on- and off-the-court skills, values, work-style preferences and motivation.
- **Partners for Success:** Partners for Success, the first mentor program in pro sports, pairs a protégé (a player 18 years or younger and ranked in the top 10) with a mentor (a volunteer retired and trained player) who shares her wisdom and experience. The mentor has lived the tennis professional's life and has valuable experience to share. A mentor does not coach a protégé, but acts as a positive influence by assisting her protégé in dealing with stressors.
- **Player Orientation:** Players individually learn the on-site realities and responsibilities of the WTA Tour in a live environment known as "Rookie Hours." Paired with written and computer tools, the orientation helps a player gain a sense of the business and her roles and responsibilities on and off the court.
- **Coach Registration and Education:** Coaches are required to participate in an orientation, agree to abide by WTA Tour Rules and sign a Coaches' code of ethics. Coaches who complete the entire program are eligible for Registered Coaches status. The WTA Tour offers an annual education symposium and one-on-one coach orientations to improve the skills of coaches, who are vital to the player's career.
- **Age Eligibility Rule:** The AER progressively allows players to play more and at a higher level, both as they mature and as they earn it. Phased-in approach allows players to compete at the appropriate level, acclimate to the extensive travel and allow for appropriate adolescent cognitive and physiological development.
- **Parent Orientation:** This new program includes one-on-one orientation for the parents to educate them about the demands of professional tennis.

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