Chronological Age and its Relation to Results of Tokyo Olympic Games 2020 as a Basis for Preparing Female Judokas for Olympic Participation

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Abstract: **Aim**: to analyze data and results of female judokas in Tokyo Olympics 2020 to identify the chronological age of younger / older judokas and its relation with results in all the seven weight categories in the Olympic Games. **Methods**: The researchers used the descriptive (survey) approach. Research community included data and results of female judokas (n=192) who participated in Tokyo Olympic Games 2020, held from 24 to 31 July 2021, representing (128) countries in (5) continents. Researchers used female judokas dates of birth and "DATEDIF" equation in "Microsoft Excel" to calculate chronological age of female judokas (day – month – year) on January 1st 2020. **Results**: younger judokas won (118) matches (55.40%) on the following weight categories: (-48) kg (58.06%) – (-52) kg (62.50%) – (-57) kg (53.57%) – (-70) kg (74.07%) – (+78) kg (66.67%). Older judokas won (95) matches (44.60%) on (-63) kg weight category (61.67%). Chi2 results indicated statistically significant correlation between age and results on P ≤0.05 in favor of younger judokas on (-48 kg - -54 kg - -70 kg - +78 kg) weight categories. Another statistically significant correlation between age and results on P ≤0.05 in favor of older judokas was shown for (-63) kg age category. No statistically significant correlation between age and results was shown for neither older no younger judokas on (-57) and (-78) kg weight categories. The researchers concluded that the mean age of younger judokas in the four weight categories (-48, -52, -70, +78) kg was (23.10) year/month and (26) days while the same value for older judokas on (-63) kg weight category was (28.11) year/month and (16) days. The researchers concluded that the best chronological age for peak competitive performance and best results was approximately (23.10) year/month. Therefore, the start of long-term planning process for Olympic participation should start at the age of (19). The chronological age for first Olympic participation should be revised to preserve the healthy development of musculoskeletal system and improving technical and tactical aspects required for elite competitive levels. This may also decrease early competitive pressure over athletes that may affect their physical and mental health negatively.

Keywords: female judo, chronological age, selection, Planning

العمر الزمني وعلاقته بنتائج دورة الألعاب الأولمبية طوكيو ٢٠٢٠ كأساس لاعداد لاعبات الجودو لدورات الاولمبية

ملخص: الهدف: تحليل بيانات ونتائج منافسـات لاعبات الجودو فى دورة الألعاب الأولمبية طوكيو٢٠٢٠، والتعرف على علاقة العمر الزمنى للاعبات الجودو الأكبر والأصغر عمراً ونتائج هذه الأولمبياد. **الاجراءات:** اسْتُخْدِمَ المنهج الوصفي لتحليل بيانات تقرير رياضة الجودو الرسمي للسيدات بدورة لألعاب الأولمبية طوكيو ٢٠٢٠، لعدد (١٩٢) لاعبة فى (٢١٣) مباراة لكل الاوزان، وتم تحليل البيانات باسـتخدام دالة DATEDIF،Min ، Max فى Excel لحسـابات العمر الزمنى للاعبات الجودو فى الأول من يناير لعام دورة الألعاب الأولمبية طوكيو ٢٠٢٠، وتم حسـاب التكرار والنسب المئوية (فوز ، هزيمة) بين اللاعبات الأكبر والأصغر عمراً، وإيجاد العلاقة بين متغيرات الدراسة باختبار Chi–square. **النتائج،** ارتفاع نسب فوز لاعبات الجودو الأصغر عمراً في (١١٨) مباراة وبنسبة مئوية (٥٥.٤٠٪)، وذلك بوزن (٤٨-كجم) بنسبة (٥٨.٠٦٪)، وفي وزن (٥٢- كجم) بنسبة (٦٢.٥٠٪)، وفي وزن (٥٧- كجم) بنسبة (٥٣.٥٧٪)، وفي وزن (٧٠- كجم) بنسبة(٧٤.٠٧٪)، وفي وزن (٧٨+ كجم) بنسبة (٦٦.٦٧)، وفازت اللاعبات الأكبر عمراً في (٩٥) مباراة بنسبة مئوية (٤٤.٦٠٪)، وذلك بوزن (٦٣-كجم) بنسبة (٦١.٦٧٪)، ونتائج اختبار Chi–square أظهرت وجود علاقة ذات دلالة إحصـائية عند مسـتوى معنوية 0.05> p ، لصـالح اللاعبات الأصـغر عمراً فى أوزان (٤٨-، ٥٤-، ٧٠-، ٧٨+ كجم) ونتائج المباريات، ولصـالح اللاعبات الأكبر عمراً فى وزن (٦٣-كجم) ونتائج المباريات، ولم تظهر علاقة للعمر الزمنى بفئتى (٥٧-، ٧٨-كجم) ونتائج المباريات، واستخلصا الباحثون أن متوسط عمر أصغر اللاعبات الفائزات في أربع أوزان (٤٨-، ٥٢-، ٧٠-، ٧٨+كجم) كان(٢٣.١٠شهر/سنة) و(٢٦ يوم)، ومتوسط عمر أكبر اللاعبات الفائزات في وزن (٦٣-كجم) كان(٢٨.١١شهر/سنة) و(١٦يوم)، واستخلصا الباحثون أن أفضل عمر زمنى يوضح استعداد اللاعبات لذروة الأداء التنافسي، وتحقيق أفضل النتائج يكون عند متوسط عمر(٢٣.١٠شهر/سنة) تقريبا، لذا فان بداية التخطيط طويل المدي لإعداد اللاعبات لدورة الأولمبية في سن ١٩سنة، أهميَّة مراجعة العمر الزمنى لبدأ المشاركة المبكرة فى الاولمبياد حفاظا على تطور العضلات والهيكل العظمى المستقر وتحسن الجوانب الفنية والخططية المطلوبة فى منافسات المستويات العليا وتقليل التعرض للضـغوط الزائد المبكرة التى تؤثر على صحتهم البدنية والنفسية.

كلمات مفتاحية: لاعبات جودو . العمر الزمني، الانتقاء، التخطيط .

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Introduction:

Among other factors including physical, technical, and mental aspects, chronological age is a major factor in selecting elite female judokas to be prepared for Olympic Games, as age differs among judokas chosen for the Olympics in case, we neglect choosing them on the basis of chronological age suitable for peak performance necessary for achieving Olympic medals. In general, Olympic Games are the best example that summarizes results of years of training and details of advances in technical and tactical performance among judokas. Therefore, it should be studied to identify current requirements and challenges that coaches and athletes should make use of to improve performance and achieve advance (**Ghazy et al. 2023**).

The twenty third Olympic Games (Tokyo 2020), held in July 2021, reminds us with the importance of following competition rules and fair play that characterize Olympic athletes. Athletic competitions are the oldest form of playing and winning as each athlete needs to master good technical and mental performance to achieve best results. This is what elite athletes do during pre-competition technical, physical and mental preparation (**Schijven & Kikkawa 2021**).

As for Tokyo Olympic 2020, only athletes committed to the Olympic Covenant had the right to qualify as qualification for the Olympics necessitates full commitment with the Olympic Covenant rules like, for example, rule no. 41 (competitors' nationality) and rule no. 43 (the anti-doping international rule and the Olympic movement rule for preventing competition manipulation). All judokas qualified for Tokyo Olympics had to be born at or before December 31st 2006 (**IJF 2021**). This means that qualified judokas had to be at least (15) years in January of the years of the Olympics. This means that competitors' age is a condition for their qualification to participate in Olympic judo competitions in addition to other qualification conditions. Older athletes have superior anthropometric and physical qualities compared with younger athletes (**Lovell et al. 2015, Romann & Cobley 2015, Cobley et al. 2009**). Furthermore, older athletes are superior in perception (decision-making – absolute thinking – creativity) and psychological factors (motivation – self-efficacy – self-respect) (**Baker et al. 2014, Cobley et al. 2009, Musch & Grondin 2001**).

Some researchers studied the relative variables of chronological age among younger and older female athletes. These studies included several sports like the relative effect of age on results of some track and field competitions (**Figueiredo et al. 2021**), the relative effect of age on results of some individual sports and its negative effects on selecting best athletes (**Jakobsson et al. 2021**), the relative effect of age on competitive performance and performance differences among those who were born in the first half and second half of the year (Lucena et al. 2020), the relative effect of age on elite track and field athletes and selecting older athletes even with elite athletes by national teams administrations in addition to concluding that best, not older, athletes should be selected (**Brustio et al. 2019**) and the relative effect of age on Olympic combat sports (boxing – Judo – wrestling – taekwondo) considering gender differences and nature of each sport (**Campideli et al. 2018**).

Judo competitions are different from other non-combat individual sports. This difference is not limited to gender as in each weight category, seven judokas win the international first rank in each gender(male/female). This means that each weight category is a completely different competition (**Krumer 2017**).

Several studies were interested in analytical research methodology for judo to anticipate Olympic performance and results. Researchers used several methods including simple frequency and multiple regression. This led to various conclusions (**Ghazy et al. 2023, Guilheiro & Franchini 2017, Franchini & Julio 2015, Lascau & Rosu 2013**). A judoka may play more than one match during the same competition. A match may last for a few seconds in case of winning with full point (Ippon) or even may last longer in case this does not happen. Each judoka exerts maximum power in each match to win the match and then a medal (**Baioumy & Ghazy 2015**).

Peak age for competitive performance indicates the athletic content that is affected by skills and qualities required for success in a specific competition. In some sports, it can be identified according to the best performance recorded by athletes in track and field and swimming (**Haugen et al. 2018, Alen and Hopkins 2015, Moesch et al. 2011**). In combat sports, performance can not be quantified by seconds or centimeters. Therefore, world championships and Olympic Games can be considered as indicators for peak athletic performance (**Franchini et al. 2020**).

Pushing young judokas to participate in national and international competitions, along with older judokas from higher age categories, and facing opponents who are older than them by 2-6 years may provide them with various experiences and develop them competitively to wing medals. But this training approach, depending on long competitive preparation, may have negative effects on their future results in addition to increasing young athletes' drop-out. Therefore, coaches should concentrate on preparing young judokas for international championships through participation in national and international competitions according to their age category. This ensures normal evolution of the musculoskeletal system of those young athletes and assures stable advances in technical and tactical aspects required for elite competitions (**Simenko 2022**).

Accordingly, it is clear that winning Olympic medals can be achieved with the combination of all factors participating in successful preparation of female judokas for Olympic tournaments. This starts with long-term and science-based planning. According to results of previous studies (**Jakobsson et al 2021, Brustio et al. 2019, Campideli et al. 2018**), The researchers think that identifying the suitable chronological age is a major factor for starting judokas' preparation for Olympic tournaments as it contributes in successful long-term planning. A few studies dealt with effects of chronological age in judo on winning chances of older and younger judokas, the suitable age for achieving peak performance and results for female judokas and the relationship between age and winning results as a basis for good selection and long-term planning for

participation in the Olympics. This led the researchers to perform this study.

Aim:

This study aimed at analyzing data and results of female judokas in Tokyo Olympics 2020 to identify the chronological age of younger / older judokas and its relation with results in all the seven weight categories in the Olympic Games.

Research Questions:

1. What is the mean ages of winner female judokas in the seven weight categories in Tokyo Olympic Games 2020?
2. What is the relationship between chronological ages of younger/older female judokas and results of Tokyo Olympic Games 2020 the seven weight categories?

Methods:

Approach:

The researchers used the descriptive (survey) approach.

Research community:

Research community included data and results of female judokas who participated in Tokyo Olympic Games 2020, held from 24 to 31 July 2021, representing (128) countries in (5) continents. Tables (1) and (2) showed numerical and statistical description of participants.

Table (1): Total Number of Female Judokas and matches of Tokyo Olympic Games 2020

Continents (n)	Countries (n)	Judokas (n)	Matches (n)	Mean age (M/Y)
5	128	192	213	25.10

Table (1) showed total number of female judokas who participated in Tokyo Olympic Games 2020. 192 female judokas on the seven weight categories participated in 213 matches.

Age calculation: Researchers used female judokas dates of birth and "DATEDIF" equation in "Microsoft Excel" to calculate chronological age of female judokas (day – month – year) on January 1st 2020 as it is the official year for holding Tokyo Olympics 2020. This date is the passing condition for minimum age qualification as participants' age should not be less than 15 years.

Table (2): Chronological Age Categories of Younger and Older Female Judkas in the Seven Weight Categories of Tokyo Olympic Games

Weight category	Mean age of younger judokas			Mean age of older judokas			Age of youngest judoka among older judokas Max			Age of oldest judoka among older judokas Min			Age of youngest judoka among younger judokas Max			Age of oldest judoka among younger judokas Min		
	D	M	Y	D	M	Y	D	M	Y	D	M	Y	D	M	Y	D	M	Y
-48 kg	26	2	23	28	3	28	11	3	33	16	11	33	28	11	17	11	10	28
-52 kg	8	5	23	28	6	28	0	10	20	16	11	37	10	9	18	18	0	29
-57 kg	26	10	21	18	7	27	26	5	21	20	6	39	20	0	19	8	4	27
-63 kg	3	9	24	16	11	28	11	10	24	0	3	32	13	2	18	19	7	31
-70 kg	3	1	23	3	8	26	18	10	22	18	11	31	2	6	20	19	6	29
-78 kg	22	11	23	26	3	28	16	11	21	3	8	32	29	8	19	5	2	27
+78 kg	22	4	24	9	0	30	13	6	21	3	0	36	23	5	19	27	11	32
المتوسط	26	6	23	20	2	28	0	10	20	20	6	39	28	11	17	27	11	32

Through table (2), the researchers made sure that all participants fulfilled age condition (15 years) to qualify for the Olympic Games through analyzing birth dates of all female judokas participating in Tokyo Olympic Games 2020 and calculating their ages on January 1st 2020. The age of the youngest judoka was (17 years, 11 months and 28 days) in (-48) kg weight category, while the age of the oldest judoka was (39 years, 6 months and 20 days) in (-52) kg weight category. Mean age of female judokas participating in Tokyo Olympic Games 2020 was (25 years, 10 months and 24 days) according to birth dates.

Younger Female Judokas: chronological age of younger female judokas was calculated using "DATEDIF" function in "Microsoft Excel" according to the matches they played. It is noteworthy that the same judokas were considered older in other matches. Mean age of younger female judokas was approximately 23.6 year/month and 26 days.

Older Female Judokas: chronological age of older female judokas was calculated using "DATEDIF" function in "Microsoft Excel" according to the matches they played. It is noteworthy that the same judokas were considered younger in other matches. Mean age of younger female judokas was approximately 28.2 year/month and 20 days.

Age of Youngest Judoka: "max" function in "Microsoft Excel" was used to extract the highest value of data as the highest value in birth dates mean the youngest in matches. Mean age of youngest judoka among older judokas was approximately 39.6 year/month and 20 days while mean age of youngest judoka among younger judokas was approximately 32.11 year/month and 27 days.

Age of Oldest Judoka: "min" function in "Microsoft Excel" was used to extract the lowest value of data as the lowest value in birth dates mean the oldest in matches. Mean age of oldest judoka among older judokas was approximately

20.10 year/month and 00 days while mean age of oldest judoka among younger judokas was approximately 17.11 year/month and 28 days.

Games 2020 (http://olympics.com). All data was available after the Olympic Games and there are no ethical conflicts preventing the use of these open-access achieve data.

Scientific Ethics:

All treated data was extracted from the open-access official websites of International Judo Federation (http://www.ijf.org) and Tokyo Olympic

Statistical Treatment:

The researchers used "DATEDIF" function in "Microsoft Excel" in addition to using SPSS software to calculate frequency, percentage and Chi^2.

Results:

Table (3): Average Age of Female Judokas according to Statistical Significance of Results in All Weight Categories in Tokyo Olympic Games 2020

Statistical significance of winning	Weight category	Average age for older judokas			Average age for younger judokas		
		Day	Month	Year	Day	Month	Year
Significant for younger	-48 ‹-52‹- 70‹+78	18	1	28	26	10	23
Significant for older	-63	16	11	28	3	9	24
Non-significant	-57 ‹-78	20	11	27	26	10	21
Average in all weight categories		20	2	28	26	6	23

Table (3) indicated that four weight categories were statistically significant in winning for younger female judokas as their average age was 23 years, 10 months, and 23 days while only one weight category was statistically significant in winning for older female judokas as their average age was 28 years, 11 months and 16 days. Only one weight category was not significant for neither younger nor older judokas as average age was 21 years, 10 months and 26 days.

Table (4): Age Differences Among Weight Categories of Female Judokas in Some Matches of Tokyo Olympics 2020

Weight categories in female judo in Tokyo Olympics 2020																					Total matches
-48kg			-52kg			-57kg			-63kg			-70kg			-78kg			+78kg			
match	Age difference		match	Age difference		match	Age difference		match	Age difference		match	Age difference		match	Age difference		match	Age difference		
	D	M		D	M		D	M		D	M		D	M		D	M		D	M	
1	11	6	13	5	2	16	7	-	13	6	2	1	-	4	2	13	7	12	8	3	-
16	12	1	24	5	5	-	-	-	18	23	3	11	4	9	-	-	-	16	9	4	-
35	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	2	-	-	1	-	-	2	-	-	2	-	-	1	-	-	2	-	-	13

Match = Order of match on Scoresheet

Table (4) indicated that ages of female judokas in some matches were very close as it does not exceed 7 days as minimum difference and 9 months and 4 days as maximum difference.

Table (5): Frequency and Percentage of Winning among Younger and Older Female Judokas in Tokyo Olympics 2020

S	Weight category (kg)	Matches (n)	Winning of older judokas		Winning of younger judokas		Chi^2	P-value
			Frequency	Percentage %	Frequency	Percentage %		
1	-48 kg	31	13	% 41.94	18	% 58.06	0.806*	0.034
2	-52 kg	32	12	% 37.50	20	% 62.50	2.001*	0.021
3	-57 kg	28	13	% 46.43	15	% 53.57	0.134	0.705
4	-63 kg	34	21	%61.76	13	%38.24	1.882*	0.023
5	-70 kg	31	11	% 35.48	20	% 64.52	2.613*	0.013
6	-78 kg	27	15	% 55.56	12	% 44.44	0.333	0.564
7	+78 kg	30	10	% 33.33	20	% 66.67	3.333*	0.026
Total		213	95	44.60	118	55.40	Sgnificant on freedom degree (1)	
Chi^2 value (2.484) is significant on P ≤0.05 and freedom degree (1)								

Table (5) indicated statistically significant differences in the number of winning matches among older and younger female judokas in favor of younger judokas on four weight categories (-48, -54, -70 and +78) as chi^2 values were significant on P ≤0.05. This indicates a positive correlation between younger age and results as the least the age the better the results of female judokas in Tokyo Olympics 2020 in these weight categories. Statistically significant differences on (-63) kg weight category were in favor of older female judokas as chi^2 values were significant on P ≤0.05. This indicates a positive correlation between younger age and results as the least the age the better the results of female judokas in Tokyo Olympics 2020 in this weight category. As for (-57) and (-78) kg weight categories, there were no statistically significant differences between the results of younger and older female judokas as frequency and percentages of winning came once in favor of younger judokas on (-57) weight category and anther in favor of older judokas on (-78) kg weight category.

Discussion:

Tables (3), (4) and (5) indicated that number of females matches in judo was (213) matches. Number of matches won by older judokas was (95) (44.60%) while number of won matches by younger judokas was (118) (55.40%). Number of matches won by judokas against opponents of the same birth year was (13). The following is detailed analysis of results for each weight category:

(-48) kg weight category: younger judokas won (18) matches (58.06%) while older judokas won (13) matches (41.94%) out of (31) matches in this weight category. Chi^2 value (0.806) was significant on P ≤0.01. These results indicated that younger and more talented judokas vectored older and more experienced opponents except for three matches as the two opponents were born in the same year: in match number (1), Chibana Gabriela (Brazil) vectored the older Bonface Harriet (Malawi) with difference in age approximately (6) months and (11) days and in match number (16), the older Rishony Shira (Israel) vectored the younger Figueroa Julia (Spain) with difference in age approximately (1) month and (12) days. In match number (35) (final), the younger Krasniqi Distria (Kosovo) vectored the older Tonaki Funa (Japan) with difference in age approximately (4) months and (9) days.

(-52) kg weight category: younger judokas won (20) matches (62.50%) while older judokas won (12) matches (37.50%) out of (32) matches in this weight category. Chi^2 value (2.001) was significant on P ≤0.01. These results indicated that younger and more talented judokas vectored older and more experienced opponents except for two matches as the two opponents were born in the same year: in match number (13), Cohen Gili (Israel) vectored the older Babamuratova Gulbadam (Turkmenistan) with difference in age approximately (2) months and (5) days and in match number (24), the younger Pupp Reka (Hungary) vectored the older Park Da-Sol (Republic of Korea) with difference in age approximately (5) months and (5) days.

(-57) kg weight category: younger judokas won (15) matches (53.570%) while older judokas won (13) matches (46.43%) out of (28) matches in this weight category. Chi^2 value (0.134) was non-significant. These results indicated that younger and more talented judokas vectored older and more experienced opponents except for one match as the two opponents were born in the same year: in match number (16), older Gjakova Nora (Kosovo) vectored the younger Verhagen Sanne (Netherlands) with difference in age of only one week.

(-63) kg weight category: older judokas won (21) matches (61.76%) while younger judokas won (13) matches (38.24%) out of (34) matches in this weight category. Chi^2 value (1.882) was significant on P ≤0.01. These results indicated that older and more experienced judokas vectored younger and more talented judokas except for three matches as the two opponents were born in the same year: in match number (13), the older Ozoba-Blach Agata (Poland) vectored the younger Garcia Estefania (Equador) with difference in age approximately (2) months and (6) days and in match number (18), the younger Beauchemin-

Pinard Catherine (Canada) vectored the older Krssakova Magdalena (Austria) with difference in age approximately (3) months and (23) days. In match number (6) the older Quadros Ketleyn (Brazil) vectored the younger David Cergia (Hondoras) by withdrawal as the later didn't pass the official weight and didn't get a rank in this competition.

(-70) kg weight category: younger judokas won (20) matches (64.52%) while older judokas won (11) matches (35.48%) out of (31) matches in this weight category. Chi^2 value (2.613) was significant on P ≤0.01. These results indicated that younger and more talented judokas vectored older and more experienced opponents except for two matches as the two opponents were born in the same year: in match number (1), the younger Matniyazova Gulnoza (Uzbekistan) vectored the older Memneloum Demos (Chad) with difference in age approximately (4) months and in match number (11), the younger Scoccimaparo Giovanna (Germany) vectored the older Rodriguez Elvismar (Venezuela) with difference in age approximately (9) months and (4) days.

(-78) kg weight category: older judokas won (15) matches (55.56%) while younger judokas won (12) matches (44.44%) out of (27) matches in this weight category. Chi^2 value (0.333) was non-significant. These results indicated that older and more experienced judokas vectored younger and more talented judokas except for one match as the two opponents were born in the same year: in match number (2), the younger Prodan Karla (Croatia) vectored the older Pekovic Jovana (Montenegro) with difference in age approximately (7) months and (13) days.

(+78) kg weight category: younger judokas won (20) matches (66.67%) while older judokas won (10) matches (33.33%) out of (30) matches in this weight category. Chi^2 value (3.333) was significant on P ≤0.05. These results indicated that younger and more talented judokas vectored older and more experienced opponents except for two matches as the two opponents were born in the same year: in match number (12), the younger Ortiz Idalys (Cuba) vectored the older Nunes Rochele (Portugal) with difference in age approximately (3) months and (8) days and in match number (16), the younger Kindzerska Iryna (Azerbaijan) vectored the older Ceric Larisa (Bosnia and Herzegovina) with difference in age approximately (4) months and (9) days.

Conclusions:

According to analysis of birth dates for (192) female judokas and their results of (213) matches in Tokyo Olympics 2020 through extracting frequency and percentages (winning/losing) for older and younger judokas for each match, results indicated that average age of younger judokas was (23 years – 6 months – 26 days) while average age for older judokas was (28 years – 2 months – 20 days).

Chi^2 results indicated statistically significant correlations on P ≤0.05 for the following weight categories: (-48 kg - -54 kg - -70 kg - +78 kg) in favor of younger judokas. This means a negative correlation as the younger the judoka the better the results. Average age for this age category was (23 years – 6 months – 26 days). The researchers think that this correlation in favor of younger judokas in Tokyo Olympics in these weight categories indicates that these judokas are in a suitable age for winning as their mean age was (23 years – 10 months – 26 days). This age represented the peak of maturity of physical and technical qualities required for winning. On the contrary, the average age for older judokas was (28 years – 1 month – 18 days) and mean age was (28 years – 6 months – 19 days). This increase in mean age led to a decrease in judokas' physical abilities required in these weight categories and this increases the chances of winning in favor of younger judokas.

There is a positive correlation between age and results in (-63) kg weight category as the correlation was statistically significant on P ≤0.05 in favor of older judokas. This means the older the judoka the better the results. Average age for this weight category was (28 years – 11 months – 16 days). The researchers think that this correlation is due to the older age of younger judokas as they were younger with only two years in comparison with other weight categories with mean age (24 years – 9 months – 3 days). This led to a decrease in their physical and technical qualities and affected their results negatively.

There was no correlation between age and results neither for older nor for younger judokas on two weight categories (-57 kg and -78 kg). average age for older judokas was (27 years – 11 months – 20 days) while the average age for younger judokas was (22 years – 11 months – 2 days) in those weight categories. The researchers think that this is due to the non-significance of Chi^2 value for winning in younger judokas in (-57kg) weight group although they were superior in percentages and frequency of winning. But their mean age was less by two years compared with their counterparts in other weight categories. Their mean age was (21 years – 10 months – 26 days). Younger judokas played (17) matches (60.71%) with age (19, 20 and 21) years, (3) matches (10.71%) with age (22) and one match (3.57%) with age

(23). This indicates that they lack competitive experience. The rest of matches were (4) (24%) with age over (24). (-57) kg is a light weight category that requires max power, speed and agility. These factors need time to improve and judokas with mean age less than (23) didn't have that time.

Also, the researchers think that the non-significance in (-78) kg weight group for older judokas is due to the non-significance of Chi2 values although they were superior in percentages and frequency of winning. Average age for younger judokas was (23 years – 11 month – 22 days) while it was (28 years – 3 month – 26 days) for older judokas. This increases the chances of winning in favor of younger judokas who had aa suitable mean age around (23) years. This is the ideals age for winning.

Younger judokas achieved superior results in some weight categories. This is consistent with previous studies indicating that younger athletes with more talent achieve better results in many tournaments compared with older athletes but some younger athletes were ignored during selection process (**Ghazy et al. 2023, Figueiredo et al 2021, Apollaro et al 2021**). This is also consistent with another study indicating that younger athletes have less chances in participating in international events even in elite levels and this means that age bias should be avoided when selecting talents and giving more chances for younger athletes (**Brustio et al 2019**).

One study (**Jakobsson et al 2021**), indicated that maltreating the effects of age bias phenomenon leads to limited selection and losing best athletes only because they are younger. In addition, the will to achieve early success may destroy talented youth in individual ad team sports. Results for (-63) kg weight category is consistent with (**Campideli et al 2018**) who indicated that older female athletes were higher in representation during 2012 and 2016 Olympic Games in combat sports (judo – wrestling taekwondo). Our results indicated that the best mean age for achieving better results in Olympic judo is (23.10) year/month and (26) days). This is consistent with (**Simenko 2022**) in that preventing young judokas from participation is to decrease early competitive overpressure of over them and to provide them with sufficient time to develop their musculoskeletal system and improve their technical and tactical skills required for elite competitions.

Accordingly, the researchers concluded the existence of correlation between age and winning results among older and younger judokas participating in Tokyo Olympics 2020 in favor of younger judokas on four weight categories (-48, -52, -70 and +78 kg) with mean age

(23.10) year/month and (26) days. This indicates the best age for peak athletic performance suitable for preparing judokas for Olympic tournaments is four years earlier than peak performance age; that is (19) years. Results also indicated a correlation between age and results in (-63) kg weight category in favor of older judokas with mean age (28.11) year/month and (16) days. As for (-57) kg and (-78) kg weight categories, there was no correlations between age and results neither for older nor for younger judokas. This means that results pointed out the best age for planning the preparation process for participation in Olympic Games.

The researchers recommend the following:

- Selecting female judokas according to peak Olympic competitive age; that is (23.10) year/month and (26) days.

- Planning for preparation process should start at the age of (19) for Olympic judokas to increase their rank in the World Ranking List for judo and to increase their competitive experience.

- Choosing the best chronological age to start the Olympic preparation so that it won't affect the physical growth of judokas negatively leading them to drop-out or early retirement.

- After studying the chronological age and its relation to results, the researchers will study the qualification condition of (15) years as a minimum age for Olympic participation.

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