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Accuracy of dental age estimation using the Demirjian, Al Qahtani, and Blenkin-Evans methods in children from Surabaya, Indonesia *

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Abstract

Age estimation is a scientific process used to determine an individual's chronological age based on biological markers, such as teeth and bones. Teeth are particularly valuable for age estimation in disaster victims due to their resilience to external pressures and high temperatures. Several methods for dental age estimation in children have been developed, including the Demirjian, Al Qahtani, and Blenkin-Evans methods. This study evaluated the accuracy of these three methods in children from Surabaya, Indonesia. The sample consisted of orthopantomographs from 129 children aged 3 to 16 years. Descriptive statistics were used to calculate both chronological and dental ages, and the Wilcoxon test and Spearman's correlation coefficient were applied to compare chronological and dental ages by age group and sex across the three methods. The mean chronological age for boys was 9.59 ± 2.92 years, and for girls was 8.18 ± 2.18 years. The Demirjian method showed a mean underestimation of 0.38 years for boys and 0.16 years for girls. In contrast, the Al Qahtani method showed a mean overestimation of 0.55 years for boys and 1.09 years for girls. The Blenkin-Evans method also displayed a mean underestimation, with 0.49 years for boys and 0.08 years for girls. The findings indicate that of age estimation accuracy varies across age stages and between genders, emphasising the need to select methods that consider these factors when applied in clinical or forensic contexts.

Keywords: age estimation; Demirjian method; AlQahtani method; Blenkin-Evans method

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Introduction

Indonesia frequently experiences various disasters, often resulting in significant loss of life. Age estimation plays a crucial role in victim identification, and grouping victims by age can streamline this process. Teeth are often used for age estimation because they are resilient to external factors, such as high temperatures, making them the hardest and most durable structures in the human body (1).

Age is defined by an individual's date of birth and the amount of time that has elapsed since that date, commonly referred to as chronological age (CA). This information is typically recorded in official documents such as birth certificates, hospital records, and governmental databases. However, when such documentation is unavailable, alternative methods for age estimation become necessary. (2) Dental age (DA), which is assessed based on the stages of tooth development, represents an important indicator of biological age. Compared with other biological age indices, DA offers several advantages. Estimation of dental age through tooth formation or mineralisation allows age assessment from the prenatal period up to approximately 18-20 years, particularly when development of the third molar is considered (3)

Several methods for dental age estimation exist, including biochemical, morphological, and radiographic techniques. Among these, radiographic methods are widely favoured due to their simplicity, non-invasiveness, cost-effectiveness, and practicality (4). Orthopantomographs, a type of dental radiograph, are commonly used in children, as the process of dental development in this age group enhances the accuracy of age estimation. Methods such as those developed by Demirjian, Al Qahtani, and Blenkin-Evans have been extensively applied in pediatric populations (5). In a population of Indian children aged 5 to 15 years, age estimation using the Demirjian method resulted in overestimation of 0.24 ± 0.80 years, 0.11 ± 0.81 years, and 0.19 ± 0.80 years in boys, girls, and the total sample, respectively (6). In the Australian population aged 5 to 17 years, Al Qahtani's atlas shows differences between chronological and dental age :-0.038 years for boys, 0.471 years for girls, and 0.509 years for all samples (7). In a population of Turkish children aged 6 to 14 years, Blenkin-Evans overestimated age by 0.54 years in boys, 0.53 years in girls, and 0.54 years overall (8).

The Demirjian method, introduced in 1973, employs eight stages of dental calcification (A-H) in seven left mandibular teeth, from the central incisor to the second molar, and differentiates between male and female development (9). This method has been widely used across various pediatric populations and has demonstrated high accuracy (6).

The Al Qahtani Atlas is another tool for age estimation in children, utilising orthopantomographs to track tooth development from 30 weeks in utero to 23.5 years of age (10). While the Al Qahtani method does not differentiate between male and female subjects and lacks specific age ranges for each developmental stage, it remains highly accurate in age estimation (11).

The Blenkin-Evans method, a modification of the Demirjian technique, also utilises eight stages of tooth calcification but focuses on the seven right mandibular teeth. It has demonstrated higher accuracy than the Demirjian method in certain populations, such as children in Sydney, Australia. This method is noted for being simpler and faster to apply, with gender differentiation based on dental calcification stages (12).

This study aims to compare the accuracy of the Demirjian, Al Qahtani, and Blenkin-Evans methods by assessing the difference between chronological age and dental age. The method with the smallest discrepancy is considered the most accurate for age estimation.

Material and methods

This study utilised an observational analytical research design with a cross-sectional approach. The sample population consisted of all orthopantomographs (OPGs) taken at the Nala Husada Dental Hospital in Surabaya between January and June 2024, involving children aged 3 to 16 years. A total of 129 OPGs were included, comprising 65 males and 64 females. To ensure data reliability, only OPGs that met specific quality criteria were used. These included interpretable image quality, and the patients selected did not have a history of growth or developmental abnormalities, nor any trauma or craniofacial defects. This study used convenience sampling to reduce excessive X-ray use. The study involved pediatric patients undergoing treatment pedodontics and orthodontics who were referred to the dental radiology department for panoramic radiography to aid in diagnosis and develop further treatment plans. Ethical approval for this research was obtained from the Health Research Ethical Clearance Commission at the Nala Husada Dental Hospital, Universitas Hang Tuah

Surabaya (Ethical Approval Number: EC/003/KEPK.RSGMNH/III/2024).
The first step involved collecting all eligible OPGs and grouping them by sex. Age estimation was initially performed using the Demirjian method, which involves calculating the maturation score of seven left mandibular teeth, from the central incisor to the second molar. These scores were then converted into dental age using a reference table. The difference between chronological age and dental age was determined, with an outcome threshold set at a maximum difference of 12 months to assess accuracy.
The same OPGs were then evaluated using the Al Qahtani atlas. This method provides an estimate of the child's age based on the developmental stages of the teeth. The difference between estimated dental age and chronological age was calculated similarly, with a 12-month threshold set for accuracy. The Blenkin-Evans method was also applied to the same OPGs. In this approach, the maturation scores of the seven right mandibular teeth were determined using the Demirjian developmental stage scoring system. These scores were entered into the Blenkin-Evans formula to calculate dental age. Again, the difference between chronological age and dental age was determined, with an outcome indicator of no more than a 12-month difference.
To analyse the data, the distribution was assessed for normality using the Kolmogorov-Smirnov test. For parametric data, a Paired T-test was conducted; for non parametric data, the Wilcoxon test was employed . All statistical analyses were performed with IBM SPSS Version 22. Finally, the accuracy of each method was evaluated by determining which method showed the smallest discrepancy between chronological and dental age.

Results

The study included 129 samples that met the inclusion criteria, consisting of 65 boys and 64 girls. The mean chronological age of the sample was 9.21 ± 2.60 years, with 9.59 ± 2.92 years for boys and 8.81 ± 2.18 years for girls. A Kolmogorov-Smirnov test was conducted to assess the normality of the data. Several groups exhibited significant values ($p < 0.05$), as detailed in Table 1, indicating that the data were not normally distributed. Consequently, the Wilcoxon test, a nonparametric alternative, was employed to compare the differences between the paired variables.
The results of the Wilcoxon test for the Demirjian method, as presented in Table 2, indicate an overall average dental age of 8.93 ± 2.70 years. The average dental age was 9.21 ± 3.04 years, for boys and 8.64 ± 2.29 years for girls. The p-value for girls using the Demirjian method was 0.11, suggesting no significant difference between dental and chronological age in this group. The mean difference between dental and chronological age in girls was 0.16 years, indicating a slight underestimation. Similarly, the Blenkin-Evans method did not show significant differences in girls, (p-value> 0.05). The mean difference between dental and chronological age for girls using the Blenkin-Evans method was 0.0872 years, also reflecting an underestimation.
In boys, the Demirjian method exhibited the smallest discrepancy between dental and chronological age, with an average underestimation of 0.38 years, suggesting that it may be the most accurate method for this group.
The results of the Wilcoxon test, as shown in Table 3, indicate a tendency toward underestimation of dental age in boys across several age groups when using the Demirjian method. Specifically, boys in the 3.01–5.00, 5.01–7.00, 9.01–11.00, 13.01–15.00, and 15.01–17.00-year age groups showed dental ages consistently lower than their chronological ages. In girls, underestimation was observed in the 7.01–9.00, 9.01–11.00, and 11.01–13.00 year age groups. Conversely, overestimation, in which dental age exceeded chronological age, was also observed in certain groups. Boys in the 11.01–13.00 year age group exhibited overestimation, while girls in the 3.01–5.00, 5.01–7.00, and 13.01–15.00 year age groups experienced similar trends.
The smallest difference between dental and chronological age was obsereved in girls aged 3.01-5.00 years, with an average discrepancy of 0.23 years and a p-value of 0.273, indicating no significant difference. For boys, the smallest difference was observed in the 11.01 to 13.00 year age group, with an average discrepancy of -0.07 years and a p-value of 0.952, indicating significant difference between dental and chronological age. However, the greatest discrepancies were observed in girls aged 13.01 to 15.00 years, with an average difference of 1.18 years, and in boys aged 15.01 to 17.00 years, with an average difference of 1.05 years. The results of the Wilcoxon test for the Al Qahtani method, as detailed in Table 4, indicate that both boys and girls consistently overestimated dental age across all age groups. The smallest discrepancy between dental and chronological age was observed in girls aged 3.01-5.00 years

of age, with a mean difference of 0.88 years and a p-value of 0.065, suggesting no statistically significant difference. In boys, the least difference was found in the 7.01–9.00
age group, with a p-value of 0.84, indicating that there were no significant differences between dental and chronological age. The largest discrepancy between dental and chronological age in girls was observed in the 13.01-15.00 age group, with a mean difference of 2.08 years. In boys, the greatest difference was observed in the 3.01-5.00 age group with a mean difference of 1.64 years.
The results of the Wilcoxon test for the Blenkin-Evans method, as shown in Table 5, reveal a general trend of underestimation of dental age in most age groups, including 5.01 to 7.00 years, 7.01 to 9.00 years, 9.01 to 11.00 years, 11.01 to 13.00 years, 13.01 to 15.00 years and 15.01 to 17.00 years. An overestimation of boys was observed only in the 3.01-to-5.00-year age group. Similarly, girls also exhibited underestimation in age groups of 3.01 to 5.00 years, 7.01 to 9.00 years, 9.01 to 11.00 years and 11.01 to 13.00 years, while overestimation occurred in age groups of 5.01 to 7.00 years and 13.01 to 15.00 years. In girls, the smallest difference between dental age and chronological age was observed in the 9.01–11.00 years age group (p-value = 0.672), indicating no statistically significant difference. For boys, the smallest mean difference was observed in the 5.01-to-7.00-year age group, (p-value = 0.806766), consistent with the suggestion that there were no significant differences between dental age and chronological age.
The results of the Spearman correlation test indicate that the Demirjian, Al Qahtani, and Blenkin-Evans methods exhibit significant correlations ($p < 0.01$). These findings demonstrate that as chronological age increases, dental age estimates also increase when using these methods.

Discussion

Radiographic methods assess age by examining the stages of tooth growth and development, which are particularly accurate in estimating age in children and adolescents. This is because dental development, especially the morphological changes of the teeth, follows a well-defined pattern during these stages of life (13). Consequently, the accuracy of dental age estimation is generally higher in children and adolescents compared to adults (5). In forensic science, an age estimation method is considered reliable when the difference between chronological and dental ages in children and adolescents is within approximately one year (14).
Although radiographic techniques are widely regarded as practical, fast, reliable, and cost-effective approaches to age estimation, their use raises ethical concerns about exposure to ionising radiation. (15) To address this issue, the present study utilised panoramic radiographs that had been previously acquired for diagnostic or therapeutic purposes and stored in the institutional archive, thereby avoiding any additional radiation exposure to the patients .
This study revealed variations in the accuracy of the Demirjian, Al Qahtani, and Blenkin-Evans methods for age estimation in children from Surabaya. Among these methods, the Blenkin-Evans method demonstrated the highest accuracy in estimating the girls age, with an average underestimation of 0.08 years between chronological and dental age. For boys, the Blenkin-Evans method showed an average underestimation of 0.49 years. In contrast, the Demirjian method was more accurate for boys, with an average underestimation of 0.38 years, whereas for girls it resulted an underestimation of 0.16 years.
However, the Al Qahtani method was found to be the least accurate of the three methods. For boys, the average overestimation was 0.55 years, while for girls, it was at 1.09 years. Overall, the study indicates that while both the Demirjian and Blenkin-Evans methods provide reasonably accurate age estimates, the Al Qahtani method tends to overestimate dental age, particularly in girls.
Previous research supports the variation in accuracy between different methods of estimating dental age. A study by Pliska et al. (2024) in children aged 3 to 17 years in Iran found that the Demirjian method slightly overestimated age, with an average overestimation of 0.025 years in boys and 0.09 years in girls (13). In a population of Indian children aged 5 to 15 years, age estimation using the Demirjian method resulted in overestimation of 0.24 ± 0.80 years, 0.11 ± 0.81 years, and 0.19 ± 0.80 years in boys, girls, and the total sample (6). Similarly, Alkandiri et al. (2021) conducted a study on children aged 5–15 years in Kuwait, which revealed that the Al Qahtani method resulted in an overestimation of chronological age of 0.60 years in girls and 0.19 years in boys (16). In the Indonesian population aged 5 to 23 years, Al Qahtani's atlas shows a difference between chronological age and dental

age ranging from -2.013 to 1.990 years (17). Furthermore, Chiam et al. (2015), in their study of children aged 2.5 to 14.5 years in Australia, reported that the Blenkin-Evans method produced an underestimation of 0.24 years in boys and an overestimation of 0.02 years in girls (18). In a population of Turkish children aged 6 to 14 years, Blenkin-Evans overestimated age by 0.54 years for boys, 0.53 years for girls, and 0.54 years for all samples (8). These findings emphasise the importance of considering regional and methodological differences in age estimation studies (19).
Variations in dental age estimation results can be attributed to multiple factors, including genetic, ethnic, and gender influences on tooth growth and development. Ethnic differences, in particular, play a significant role in the timing and progression of dental maturation, leading to varying levels of accuracy in dental age estimation across populations (17). In addition, developmental changes and a range of intrinsic and extrinsic factors can further impact dental development. Intrinsic factors, such as genetics, along with extrinsic factors, including nutrition, are crucial in shaping the human growth process. Several studies have highlighted the relationship between population-specific differences and the timing of tooth development, emphasising the role of genetic and environmental influences in determining the pace of dental maturation (19).
Age estimation through radiographs can be conducted using two primary approaches: assessment procedures and atlas-based methods. The Demirjian and Blenkin-Evans methods are examples of assessment procedures, while the Al Qahtani method utilises an atlas-based approach (17). Atlas-based methods, such as the Al Qahtani method, rely on diagrams that illustrate the morphological structure of tooth development and eruption patterns. The Al Qahtani Atlas specifically tracks dental development from 30 weeks intrauterine to 23 years of age. However, this method has limitations, including its inability to differentiate between male and female dental development, which introduces significant variability. Additionally, inter-observer variability tends to be higher, increasing the potential for error. This is corroborated by studies that demonstrating that the average difference between chronological and dental age using the Al Qahtani method is greater than that with the Demirjian and Blenkin-Evans methods. In contrast, methods based on assessment procedures, such as the Demirjian and Blenkin-Evans methods, are more suited to distinguish between male and female age groups. However, these methods are limited by certain dental anomalies, such as permanent tooth loss, root remnants, agenesis, or malformations, which can reduce their applicability. The scoring-based approach used in these methods is more accurate for age intervals between 2.5 and 14 years and is effective in differentiating the ages of boys and girls (5).
The findings of this study indicate that the age estimation using the Demirjian and Blenkin-Evans methods is more accurate in girls than in boys. The analysis of tooth mineralisation patterns revealed that the early stages of tooth development are nearly identical between boys and girls, and that sexual differences in the rate of development occur around the time of crown completion and continue to increase during root development, with girls reaching most developmental stages earlier than boys (20).

Conclusion

Although, based on the age estimation study conducted in paediatric patients at Nala Husada Dental Hospital in Surabaya, among these methods, the Blenkin-Evans method demonstrated the highest accuracy in estimating the age of girls, with an average underestimation of 0.09 years between the chronological and dental ages. The Demirjian method showed greater accuracy than the Al Qahtani method, which had the lowest accuracy for age estimation in girls, with an average difference of 1.09 years (overestimation). The findings indicate that age-estimation accuracy varies across age stages and between sexes, emphasising the need to select methods that consider these factors when applied in clinical or forensic contexts.

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Declaration of Interest

None

Author Contributions

HW For research articles with four authors, a brief paragraph explaining each author's contribution is required. The following statements should be used: Conceptualisation, S.R.A.A; methodology, S.R.A.A, I.A.A., and D.A.R; validation, S.R.A.A., I.A.A., D.A.R.,A.K., and A.M; formal analysis, S.R.A.A; investigation, S.R.A.A, and A.K;

resources, A.M.; data curation, S.R.A.A.; original draft writing, S.R.A.A.; review and editing, S.R.A.A., I.A.A., D.A.R., A.K., and A.M; All authors have contributed and approved the final draft of the manuscript.

Statement on the use of artificial intelligence in manuscript preparation
Artificial intelligence was not used in the preparation of this manuscript.

Table 1. Descriptive analysis of three different dental age estimation methods.

Sex	n	DAE method	Mean±SD CA (years)	Mean DA (years)	CA - DA (years)
Boys	65	Demirjian	9.59 ± 2.92	9.21	-0.38
		Al Qahtani		10.15	0.55
		Blenkin-Evans		9.1	-0.49
Girls	64	Demirjian	8.81 ± 2.18	8.65	-0.17
		Al Qahtani		9.91	0.71
		Blenkin-Evans		8.72	-0.09

DAE: Dental Age Estimation; CA: Chronological Age; DA: Dental Age

Table 2. Wilcoxon Test Results by Gender in Demirjian, Al Qahtani and Blenkin-Evans Methods.

Methods	N	CA		DA		*p*	CA-DA	Trend
		Mean	SD	Mean	SD			
Demirjian								
Boys	65	9.59	2.92	9.21	3.05	0.029*	0.38	U
Girls	64	8.81	2.18	8.64	2.29	0.118	0.17	U
Total	129	9.20	2.60	8.93	2.70	0.009*	0.27	U
AlQahtani								
Boys	65	9.59	2.92	10.14	3.28	0.006*	-0.55	O
Girls	64	8.81	2.18	9.90	2.59	0.001*	-1.09	O
Total	129	9.20	2.60	10.03	2.95	0.001*	-0.82	O
Blenkin-Evans								
Boys	65	9.59	2.92	9.10	2.64	0.001*	0.49	U
Girls	64	8.81	2.18	8.72	2.26	0.229	0.09	U
Total	129	9.21	2.60	8.91	2.46	0.002*	0.29	U

* indicates a significant difference between CA and DA; U: Underestimation of DA; O: Overestimation of DA

Table 3. Wilcoxon Test Results on Age Group and Gender Demirjian Method.

Girls		CA		(DA)		p	CA-DA	Trend (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	4	4.62	0.23	4.85	0.26	0.27	-0.23	O
5.01-7.00	8	5.51	0.63	5.94	1.63	0.48	-0.43	O
7.01-9.00	22	8.28	0.53	7.95	0.74	0.02	0.33	U
9.01-11.00	22	10.15	0.37	9.87	1.50	0.23	0.28	U
11.01-13.00	7	11.79	0.63	11.4	0.94	0.23	0.39	U
13.01-15.00	1	13.42	0	14.6	0	0	-1.18	O
15.01-17.00	0	0	0	0	0	0	0	
Boys		CA		DA		P	CA-DA	*Trend* (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	2	4.36	0.83	4.00	0.85	0.65	0.36	U
5.01-7.00	13	6.24	0.61	6.13	0.87	0.75	0.11	U
7.01-9.00	16	8.03	0.58	7.89	1.52	0.26	0.14	U
9.01-11.00	13	10.04	0.62	9.36	1.04	0.04	0.68	U
11.01-13.00	9	11.8	0.54	11.90	1.92	0.95	-0.07	O
13.01-15.00	9	13.66	0.49	12.66	2.45	0.26	1.01	U
15.01-17.00	3	15.12	0.13	14.07	2.39	0.59	1.05	U

CA: Chronological age; DA: Dental age; *: indicate a significant difference between CA and DA; U: Underestimation of DA; O: Overestimation of DA.

Table 4. Wilcoxon Test Results on Age Group and Gender Al Qahtani Methods.

Girls		CA		DA		p	CA-DA	Trend (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	4	4.62	0.21	5.5	0	0.06	-0.88	O
5.01-7.00	8	5.51	0.63	7.25	1.67	0.04	-1.74	O
7.01-9.00	22	8.28	0.53	9.18	1.36	0.01	-0.89	O
9.01-11.00	22	10.15	0.37	11.14	1.65	0.01	-0.99	O
11.01-13.00	7	11.79	0.63	13.07	2.07	0.31	-1.28	O
13.01-15.00	1	13.42	0	15.50	0	0	-2.08	O
15.01-17.00	0	0	0	0	0	0	0	
Boys		CA		DA		p	CA-DA	*Trend* (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	2	4.36	0,83	6	0.71	0.18	-1.64	O
5.01-7.00	13	6.24	0.61	6.73	0.83	0.02	-0.49	O
7.01-9.00	16	8.03	0.58	8.19	1.45	0.84	-0.16	O
9.01-11.00	13	10.04	0.62	10.81	2.18	0.12	-0.77	O
11.01-13.00	9	11.83	0.54	12.83	2.00	0.11	-1.00	O
13.01-15.00	9	13.66	0.49	14.06	1.33	0.33	-0.39	O
15.01-17.00	3	15.12	0.13	15.5	1.00	0.59	-0.38	O

CA: Chronological age; DA: Dental age; *: indicate a significant difference between CA and DA; U: Underestimation of DA; O: Overestimation of DA

Table 5. Wilcoxon Test Results on Age Group and Gender Blenkin-Evans Methods.

Girls		Chronological Age (CA)		Dental Age (DA)		*p*-value	CA-DA	*Trend* (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	4	4.62	0.2092845	4.4575	0.2605603	0.461451	0.1625	U
5.01-7.00	8	5.51125	0.6255383	6.16	1.3742842	0.400814	-0.64875	O
7.01-9.00	22	8.2822727	0.5343704	8.013636364	0.7285442	0.022002	0.26864	U
9.01-11.00	22	10.145455	0.3702216	9.992727273	1.2695938	0.672945	0.15273	U
11.01-13.00	7	11.788571	0.6286077	11.62142857	1.1301833	0.865772	0.16714	U
13.01-15.00	1	13.42	0	13.74	0	0	-0.32	O
15.01-17.00	0	0	0	0	0	0	0	
Boys		Chronological Age (CA)		Dental Age (DA)		*p*-value	CA-DA	*Trend* (U/O)
Age groups (Years)	N	*Mean (Years)*	SD	*Mean (Years)*	SD			
3.01-5.00	2	4.355	0.8273149	4.55	0.5374012	0.654721	-0.195	O
5.01-7.00	13	6.24	0.6090703	6.213846154	0.6997325	0.806766	0.02615	U
7.01-9.00	16	8.029375	0.5763849	7.779375	1.2518332	0.087829	0.25	U
9.01-11.00	13	10.039231	0.6191858	9.705384615	1.3093422	0.29436	0.33385	U
11.01-13.00	9	11.831111	0.5425966	11.22222222	1.2928919	0.173071	0.60889	U
13.01-15.00	9	13.661111	0.4932911	12.51555556	1.5851113	0.066316	1.14556	U
15.01-17.00	3	15.116667	0.1327906	12.47	0	0.10247	2.64667	U

Table 6. Spearman Correlation Test.

x			DEMIRJIAN	AL QAHTANI	BLENKIN EVANS	Chronological Age
Spearman's rho	DEMIRJIAN	Correlation Coefficient	1.000	0.918**	0.957**	0.893**
		Sig. (2-tailed)		0.000	0.000	0.000
		N	129	129	129	129
	AL QAHTANI	Correlation Coefficient	0.918**	1.000	0.931**	0.871**
		Sig. (2-tailed)0	0.000		0.000	0.000
		N	129	129	129	129
	BLENKIN EVANS	Correlation Coefficient	0.957**	0.931**	1.000	0.912**
		Sig. (2-tailed)	0.000	0.000		0.000
		N	129	129	129	129
	Chronological Age	Correlation Coefficient	0.893**	0.871**	0.912**	1.000
		Sig. (2-tailed)	0.000	0.000	0.000	
		N	129	129	129	129

***. Correlation is significant at the 0.01 level (2-tailed).*

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