

SUPPLEMENTARY MATERIALS

Research dynamics in the applicability of radiological mandibular parameters for forensic sex and age estimation: A systematic review

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Table S1. Studies included in the systematic review.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
Indira et al. (2012)	India	100 (50 M, 50 F)	20-50	Sex	Panoramic Radiographs (OPGs)	Ramus Breadth, Condylar Height, Projective Height of Ramus, and Coronoid Height	76%	Mandibular ramus identified as the best sex predictor.
Chandra et al. (2013)	India	100	18-62	Sex	Panoramic Radiographs (OPGs)	Mental Foramen	Not men- tioned	Males showed significantly higher average values for both the superior and inferior distances from the men- tal foramen to the lower mandibular border.
Chole et al. (2013)	India	1060 (566 M, 494 F)	15 to 66+	Both Sex & Age	Panoramic Radiographs (OPGs)	Gonial angle, Antegonial angle, Antegonial Depth	Not men- tioned	Ant. A, Ant. D, GA showed no signif- icant correlation with age but differed significantly between sexes.
Bharad- waj et al. (2014)	India	300 (150 M,150 F)	25-54	Both Sex & Age	Panoramic Radiographs (OPGs)	Gonial Angle, Antegonial Angle, Mental Foramen, Mandibular Canal, Mandibu- lar Foramen.	Not men- tioned	Ant. A, Ant. D, GA showed no signif- icant correlation with age but differed significantly between sexes. While sex-based comparison of GA, Ant. A, mandibular canal and mandibular fo- ramen showed statistically significant differences. Among all parameters, changes in the mandibular canal and mandibular foramen were most sig- nificant with advancing age.
İlgüy et al. (2014)	Euro- pean de- scent	161 (66 M, 95 F)	18-85	Sex	CBCT	Foramen magnum, Gonial angle, Ramus length, Minimum Ramus Breadth, Mandibular Base Length, Bigonial Breadth, Bicondylar Breadth	83.2%	The study identified GA, RL, MBL, BGW as the final predictors of sex.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
Dhaka et al. (2015)	India	90 (52 F, 38 M)	8-20	Both Sex & Age	Lateral Cephalogram	Mandibular Body Length, Mandibular Length, Mandibular Height	Not mentioned	The study found no significant age-related increase in gonial angle, though females had larger angles. A significant increase in mandibular length (Gn to Go) was observed in females aged 8–12 years, indicating peak growth during this period.
Muskaan and Sarkar (2015)	India	40	21-60	Both Sex & Age	Panoramic Radiographs (OPGs)	Mental Index, Maximum Ramus Breadth, Minimum Ramus Breadth, Coronoid Height	Not mentioned	MI and CrH showed significant differences for both age and sex, while MRB was significantly different between sexes.
Damera et al. (2016)	India	80	20-50	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Breadth, Minimum Ramus Width, Maximum Condylar Height, Maximum Height of Ramus, Gonial Angle, Bigonial Width	83%	The greatest sexual dimorphism was observed in the CH.
Kallali et al. (2016)	India	30 (15 M, 15 F)	10-60	Sex	3D CT	Gonial angle, Ramus length, Minimal Ramus Breadth, Coronoid Height, Gonion Gnathion Length, Bicondylar Breadth, Bigonial Length	76%	The study found that five out of seven parameters – GA, RL, mRB, CrH, – showed significant differences ($P < 0.05$), with an overall accuracy of 86% for males and 82% for females.
Kumar et al. (2016)	India	308 (154 M, 154 F)	20-69	Sex	Panoramic Radiographs (OPGs)	Bi-condylar Width, Bi-gonial Width, Bi-mental Width, Maximum Ramus Breadth, Minimum Ramus Breadth	71.1%	BCW, BGW, MFW, MRB, and mRB showed statistically significant differences, indicating clear sexual dimorphism and their usefulness in sex determination.
Leversha et al. (2016)	Australia	220	19-69	Both Sex & Age	Panoramic Radiographs (OPGs)	Gonial Angle, Bigonial Width, Ramus height	Not mentioned	Males had statistically significantly larger RH and BGW than females, whereas females had significantly larger gonial angles than males.

Samatha et al. (2016)	India	120 (60 M, 60F)	18-45	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Breadth, Minimum Ramus Breadth, Condylar Height/Maximum Ramus Height, Projective Height of Ramus, Coronoid Height	Not mentioned	P < 0.05 for MRB, CH, PRH.
Sambhana et al. (2016)	India	384 (192 M, 192 F)	7-75	Sex	Panoramic Radiographs (OPGs)	Minimum Ramus Breadth, Maximum Ramus Breadth, Mandibular Length, Bicondylar Breadth, Mandibular Index, Ramus Height, Mandibular Body Height, Gonial Angle, Bigonial Width, Coronoid Height	75.8%	CrH was the single best parameter indicating sexual dimorphism.
Chaurasia and Giri (2017)	India	150	20-30	Age, Sex	CBCT	Condylar Height, Condylar Width, Condylar Length	Not mentioned	Condylar width showed statistically significant differences in values for both age and sex.
Deng et al. (2017)	China	219 (111 M, 108 F)	23-63	Sex	CBCT Scan	Bi-condylar Breadth, Bigonial Breadth, Antegonial Notch Breadth, Mental Foramina Breadth	Not mentioned	All the described breadth dimensions were sexually dimorphic, significantly larger in males than in females.
Kanya et al. (2017)	Indonesia	200 (100 M, 100 F)	14-35	Sex	Panoramic Radiographs (OPGs)	Ramus Height, Gonial Angle, Bigonial Width, Condylar Ramus Height, Coronoid Ramus Height, Maximum Ramus Breadth, Minimum Ramus Breadth, Mental Index	Not mentioned	Mandibular parameter values were generally higher in males than females, except for GA. Statistically significant differences were noted in RH, BGW, CRH, CoRH, MRB and mRB in both the sexes.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
More et al. (2017)	India	1000 (500 M, 500 F)	21-60	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Breadth, Minimum Ramus Breadth, Condylar Height, Projective Height of Ramus, Coronoid Height	69%	Mean dimensions of all ramus parameters statistically significant and higher in males. Mean MRB and mRB were 27.44 ± 3.41 mm and 32.27 ± 3.40 mm, respectively. CH and PRH measured 71.78 ± 5.98 mm and 65.62 ± 6.19 mm, while CrH was 59.23 ± 6.08 mm. A significant correlation was observed between sex and mandibular ramus morphology ($p < 0.05$).
Satish et al. (2017)	India	200 (100 M, 100 F)	18-30	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Height, Bigonial Width, Bicondylar Breadth	Not men- tioned	CH proved to be the most dimorphic parameter
Alias et al. (2018)	Malaysia	79 (48 M, 31 F)	18-74	Sex	PMCT	Maximum Ramus Breadth, Minimum Ramus Breadth, Condylar Height, Maximum Ramus Height, Coronoid Height, Mandibular Height, Symphyseal Height, Bigonial Breadth, Bicondylar Breadth	78.5%	All parameters significantly greater in males vs. females ($p < 0.01$). Statistically significant differences in BGW and CH between the sexes.
Bhuyan et al. (2018) [49]	India	50 (25 M, 25 F)	11-79	Age, Sex	Panoramic Radiographs (OPGs)	Ramus Width, Maximum Ramus Breadth, Minimum Ramus Breadth, Condylar Height, Projective Height of Ramus, Coronoid Height, Gonial Angle, Bigonial Width	Not men- tioned	A statistically significant sex difference was observed for GA, RH, and BGW. All parameters increased with age, with significant differences on the right side for GA and RH.

Dosi et al. (2018)	India	545	20-90	Age, Sex	Panoramic Radiographs (OPGs)	Mental Foramen, Ramus Height	Not mentioned	Statistically significant results were obtained for Mental foramen and RH with age and sex..
Sairam et al. (2018)	India	150	Any age group	Age, Sex	Panoramic Radiographs (OPGs)	Gonial Angle, Ramus Height, Condylar Height, Ramal Notch Depth, Cortical Bone Thickness	Not mentioned	When sex alone was assessed, significant differences were observed for GA (Lt side), RH, condylar length, and RND (Rt side) and cortical bone thickness on both sides. Cortical bone thickness and condylar length also showed significant differences with age.
Abd El-salam et al. (2019)	Egypt	102 (51 M, 51 F)	20-50	Age, Sex	CBCT Scan	Gonial Angle, Bimental Breadth, Bigonial Width, Bicondylar Breadth, Bicoronoid breadth, Mental Index, Height of Mandible from Mental Foramen, Maximum Mandibular Length, Mandibular Index	M = 83.7%; F = 81.3%	The study showed a statistically significant difference ($P < 0.05$) in right GA, right MI, right and left MH from the mental foramen, BGW, BCW, BiCrW, maximum mandibular length, and mandibular index.
Albalawai et al. (2019)	Saudi Arabia	200	18-60	Sex	CBCT Scan	Gonial Angle, Gonial Height, Bigonial Width	67%,	Sex predicted using these parameters ($P < 0.0001$).
Belaldavar et al. (2019)	India	304 (149 M, 155 F)	18-30	Sex	Lateral Cephalogram	Gonial Angle	56.3%	Mean GA of 122.7° in females and 121.1° in males was statistically significant with females having larger GA as vs. males.
Bulut et al. (2019)	Turkey	300 (150 M, 150 F)	20-80	Sex	CT Scan	Gonial Angle	Not mentioned	Males had slightly smaller GA values than females across all age groups (I, II, and III). No significant sex difference was observed in groups I and II, while a statistically significant difference ($P < 0.05$) was noted in group III.
Chalkoo et al. (2019)	India	80 (40M, 40F)	18-50	Sex	Panoramic Radiographs (OPGs)	Ramus Breadth, Condylar Height, Projective Ramus Height, Coronoid Height	Not mentioned	Sexual dimorphism was statistically significant for CrH, CH, and PRH.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
Tassoker et al. (2019)	Turkey	121 (50 M, 71 F)	10-69	Age, Sex	CBCT Scan	Gonial Angle, Ramus Length, Maximum Ramus Breadth, Minimum Ramus Breadth, Bigonial Width	Not men- tioned	Statistically significant differences between mandibular measurements from CBCT and PR scans; PR showed comparatively higher values.
Behl et al. (2020)	India	400 (200 M, 200 F)	10-40	Age, Sex	Panoramic Radiographs (OPGs)	Ramus Breadth, Condylar Ramus Height, Coronoid Ramus Height, Gonial Angle	Not men- tioned	Males showed increased value for RB, CRH, CoRH. Age and ramus linear measurements were significantly and positively correlated.
Bagher- pour et al. (2020)	Iran	202 (101 M, 101 F)	18-50	Sex	Lateral Cepha- logram	Nasion, Anterior Nasal Spine, Posterior Nasal Spine, Menton, Infradental, Articular, Gonion, Condylion, Gnathion, Mandibular Ramus Height	87.6%	Based on the analyses, facial height (NMe), MRH, mandibular plane (MeGo), and frontal sinus width (Fswd) were the most significant contributors to sexual dimorphism among the selected parameters.
Motawei et al. (2020)	Egypt	213 (99 M, 114 F)	7-58	Age, Sex	CBCT Scan	Ramus Length	67%	Mean length of mandible ramus differed significantly between males and females.
Okkesim and Er- hamza (2020)	Turkey	70 (35 M, 35 F)	Not men- tioned	Sex	CBCT Scan	Coronoid Height, Condylar Height, Mandibular Ramus Height, Minimum Ramus Breadth,	Not men- tioned	All ramus parameters from CBCT differed statistically between the sexes ($P < 0.05$).
Ramesh et al. (2020)	India	150	20-70	Age, Sex	Panoramic Radiographs (OPGs)	Condylar Ramus Height, Coronoid Ramus Height	Not men- tioned	CRH and CoRH values were significantly higher in males than females and also showed significant differences with age.

Saloni et al. (2020)	India	200	21-70	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Breadth, Minimum Ramus Breadth, Coronoid Height, Condylar/ Maximum Ramus Height, Projective Ramus Height	77.6%	Mean mRB, MRH, and PRH significantly higher among males, while MRB slightly higher in females.
Shah et al. (2020)	India	300 (150 M, 150 F)	10-69	Age, Sex	Panoramic Radiographs (OPGs)	Gonial Angle, Ramus Height, Bigonial Width	Not mentioned	Statistically significant age-related differences were observed in GA dimensions. For sex, GA, RH and BGW showed highly significant differences.
Anerao et al. (2021)	India	100 (50 M, 50 F)	20-69	Age, Sex	Panoramic Radiographs (OPGs)	Mandibular Body Height, Mental Foramen to Mandibular Distance, Mandibular Ramus Height, Mandibular Ramus Height	Not mentioned	The overall mean values of D1, D2, D3, and D4 were significantly higher in males across all age groups, with D4 showing a particularly high level of significance.
Chan-drsekhar et al. (2021)	India	80	10-35	Sex	Lateral Cephalogram	Total Mandibular Body Length, Mandibular Length, Mandibular Height, Gonial Angle	Not mentioned	Statistically significant sex differences were observed for the ML, MH, and the age of the study participants ($p < 0.05$).
Garg et al. (2021)	Malaysia	180	21-60	Age, Sex	Panoramic Radiographs (OPGs)	Ramus Breadth, Height of Coronoid Process, Mental Index	Not mentioned	MRB showed significant differences for ethnic determination whereas MRB showed significant differences for age estimation. CrH and MRB showed statistically significant result between male and female.
Kumari et al. (2021)	India	50 (25 M, 25 F)	20-40	Sex	Panoramic Radiographs (OPGs)	Condylar Height, Coronoid Height, Gonial angle	Not mentioned	CH and CrH on both right and left sides were significantly higher in males than females. Although GA values were higher in males, the differences between sex were not statistically significant. All three variables showed higher mean values in males.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
Ojha et al. (2021)	Nepal	216	17-39	Sex	Panoramic Radiographs (OPGs)	Condylar Height, Coronoid Height, Projective Height of Ramus, Maximum Ramus Breadth, Gonial Angle, In- tergonial Width	63.4%	The vertical parameters were found to be greater in males than in females. CrH was the most dimorphic param- eter in discriminant analysis.
Suguna and Ravindran (2021)	India	100 (37 M, 63 F)	14-35	Age, Sex	Panoramic Radiographs (OPGs)	Gonial Angle, Bigonial Width, Ramus Height	Not men- tioned	Increased BGW was found in males when compared to females and the difference was found to be statistically highly significant
Arthanari (2022)	India	50 (25 M, 25 F)	51-60	Sex	Panoramic Radiographs (OPGs)	Gonial Angle	Not men- tioned	Statistically significant correlation be- tween GA of males and females was confirmed.
Ayesha et al. (2022)	India	200 (100 M, 100 F)	9-20	Age	OPGs and Lateral Cephalogram	Gonion, Gnathion, Mandibular Body Length, Mandibular Length, Mandib- ular Height	OPG = 93.8% Lateral cephalo- gram = 79.7%	RH was found to be best parameter for age estimation.
Ingalesh- war et al. (2022)	India	200 (100 M, 100 F)	18-58	Sex	Panoramic Radiographs (OPGs)	Condyle-Coronoid Angle, Gonial Angle	Not men- tioned	Significant differences in GA and CCA in both sexes with females hav- ing higher values than males.
Moham- med et al. (2022)	India	300	20-60	Sex	Panoramic Radiographs (OPGs)	Mandibular Ramus, Position of Mental Foramen, Inter- condylar Distance	Not men- tioned	10 out of 14 mandibular variables, including ramus and mental foramen measurements, showed statistically significant sexual dimorphism.
Shakya et al. (2022)	Nepal	150	18+	Sex	Panoramic Radiographs (OPGs)	Maximum Ramus Breadth, Minimum Ramus Breadth, Condylar Height/ Maximum Ramus Height, Projective Height of Ramus, Coronoid Height	84%	CH predicted sex.

Ulusoy & Ozkara (2022)	Turkey	1100 (550 M, 550 F)	3-13	Age, Sex	Panoramic Radiographs (OPGs)	Ramus Height, Condylar Ramus Height, Coronoid Ramus Width, Minimum Ramus Width, Bigonial Width, Bicondylar Width, Bimental Width, Gonial Angle	66.72%	Linear dimensions higher in males vs. females across all ages. GA did not vary by sex.
Vora and Arthanari (2022)	India	60 (30 M, 30 F)	30-35	Sex	Panoramic Radiographs (OPGs)	Mandibular Maximum Ramus Breadth	Not mentioned	There is a significant difference between RB of males and females.
Deana et al. (2023)	South America	594 (204 M, 390 F)	18-84	Sex	Panoramic Radiographs (OPGs)	Mandibular Angle, Mandibular Ramus Height, Bigonial Breadth, Condylar Coronoid Distance, Bicondylar Breadth, Distance from the Mental Foramen to Mandibular Base, Distance between Mental Foramina, Distance from the Mandibular Notch – Mandibular Lingula	Not mentioned	The best sex predictor was MRH, followed by distance from the HMF-MB and BCW.
Esfehiani et al. (2023)	Iran	290 (145 M, 145 F)	18-70	Sex	Panoramic Radiographs (OPGs)	Minimum Ramus Width, Maximum Ramus Width, Condylar Height, Coronoid Height, Antegonial Angle, Antegonial Depth, Gonial Angle, Distance between the superior border of the Mental Foramen and the inferior border of the Ramus, Distance between the inferior border of the Mental Foramen and the inferior border of the Ramus, Bicondylar Breadth, Bigonial Breadth	Not mentioned	All indices, except GA, showed significant sex differences and were useful for sex determination in the univariate model. Even after adjusting for confounders, CH, CrH, and MF-IR Dist (Sup) remained significantly greater in males ($P < 0.05$). The best model for sex estimation used BCW, CH, CrH, mRB, and superior border mental foramen. Values >56% indicated males, lower values indicated females.

Author (Year)	Country	Sample size	Age group (years)	Outcome type	Radiological modality used	Parameters assessed	Accuracy Percentage	Major Outcomes
Qaraghouli et al. (2023)	Egypt	60 (30 M, 30 F)	18 +	Sex	CBCT Scan	Coronoid Height, Mandibular Ramus Height,	84.2%	The measured variables (CrH and PRH) showed a statistically significant difference between the sexes.
Aggarwal et al. (2024)	India	90	17 -21	Sex	Panoramic Radiographs (OPGs)	Condylar Area, Condylar Perimeter, Condylar Height, Ramal Height, Ramus Tangent, Total Height	Not mentioned	CH was significantly greater in males than females.
Arthanari et al. (2024a)	India	500 (250 M, 250 F)	41-50	Age and sex	Panoramic Radiographs (OPGs)	Projective Ramus Height, Bigonial Width, Antegonial Depth, Antegonial Angle, Maximum Ramus Breadth	89.4%	BGW was preferred for age, while Ant.A for sex estimation. Age and sex estimation using these variables was achieved in this sample from India.
Arthanari et al. (2024b)	India	500 (250 M, 250 F)	20-30	Age, Sex	Panoramic Radiographs (OPGs)	Condylar Ramus Height, Minimum Ramus Breadth, Projective Ramus Height	Not mentioned	CRH suitable for age estimation, while GA, CoRH, and PRH preferable for sex estimation.
Arthanari et al. (2024c)	India	500 (250 M, 250 F)	20-30	Sex	Panoramic Radiographs (OPGs)	Gonial Angle, Antegonial Angle	Not mentioned	GA was found to be best predictor of sex.

Table S2. Risk-of-Bias assessment of included studies using the JBI Critical Appraisal Checklist.

AUTHOR (YEAR)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	TOTAL YES	RISK
Indira et al. (2012)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Chandra et al. (2013)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Chole et al. (2013)	Y	Y	Y	Y	Y	U	Y	Y	7	LOW
Bhardwaj et al. (2014)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Ilguy et al. (2014)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Dhaka et al. (2015)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Muskan and Sarkar (2015)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Damera et al. (2016)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Kallali et al. (2016)	Y	Y	Y	Y	U	Y	Y	Y	7	LOW
Kumar et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Leversha et al. (2016)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW
Samatha et al. (2016)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Sambhana et al. (2016)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Chaurasia and Giri (2017)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Deng et al. (2017)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Kanya et al. (2017)	Y	Y	Y	Y	U	N	Y	Y	6	MODERATE
More et al. (2017)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Satish et al. (2017)	Y	Y	Y	Y	U	N	Y	Y	6	MODERATE
Alias et al. (2018)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Bhuyan et al. (2018)	Y	Y	Y	Y	U	N	U	Y	5	MODERATE
Dosi et al. (2018)	Y	Y	Y	Y	N	N	U	Y	5	MODERATE
Sairam et al. (2018)	Y	Y	U	Y	Y	Y	Y	Y	7	LOW
Abd Elsalam et al. (2019)	Y	Y	Y	Y	U	N	Y	Y	6	MODERATE
Albalawai et al. (2019)	Y	Y	U	Y	Y	Y	Y	Y	7	LOW
Beladavar et al. (2019)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Bulut et al. (2019)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Chalkoo et al. (2019)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Tassoker et al. (2019)	Y	Y	Y	Y	Y	U	Y	Y	7	LOW
Behl et al. (2020)	Y	Y	U	Y	U	N	Y	Y	5	MODERATE
Bagherpour et al. (2020)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Motawei et al. (2020)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Okkesim and Erhamza (2020)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Ramesh et al. (2020)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE

AUTHOR (YEAR)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	TOTAL YES	RISK
Saloni et al. (2020)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Shah et al. (2020)	Y	Y	U	Y	Y	N	Y	Y	6	MODERATE
Anerao et al. (2021)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Chandrasekhar et al. (2021)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Garg et al. (2021)	Y	Y	Y	Y	Y	U	Y	Y	7	LOW
Kumari et al. (2021)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Ojha et al. (2021)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Suguna and Ravindran (2021)	Y	Y	Y	Y	U	N	Y	Y	6	MODERATE
Arthnari et al. (2022)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Ayesha et al. (2022)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW
Ingaleshwar et al. (2022)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Mohammed et al. (2022)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Shakya et al. (2022)	Y	Y	Y	Y	N	N	Y	Y	6	MODERATE
Ulusoy and Ozkara (2022)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Vora and Arthanari (2022)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Deana et al. (2023)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Esfehani et al. (2023)	Y	Y	Y	Y	Y	Y	Y	Y	8	LOW
Qaraghoulí et al. (2023)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW
Aggarwal et al. (2024)	Y	Y	U	Y	N	N	Y	Y	5	MODERATE
Arthanari et al. (2024a)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW
Arthanari et al. (2024b)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW
Arthanari et al. (2024c)	Y	Y	Y	Y	Y	N	Y	Y	7	LOW