

評価対象論文リスト(要因:咀嚼力・咀嚼能力低下、アウトカム:フレイル・サルコペニア)

評価判定日:2024/11/29

(フレイル)

①既存の系統的レビュー・メタ解析・統合解析

1	Slashcheva LD, Karjalahti E, Hassett LC, Smith B, Chamberlain AM. A systematic review and gap analysis of frailty and oral health characteristics in older adults: A call for clinical translation. <i>Gerodontology</i> . 2021;38(4):338-350. doi:10.1111/ger.12577
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②日本人の個別研究

2	Horibe Y, Watanabe Y, Hirano H, et al. Relationship between masticatory function and frailty in community-dwelling Japanese elderly. <i>Aging Clin Exp Res</i> . 2018;30(9):1093-1099. doi:10.1007/s40520-017-0888-3
3	Murotani Y, Hatta K, Takahashi T, et al. Oral functions are associated with muscle strength and physical performance in old-old Japanese. <i>IJERPH</i> . 2021;18(24):13199. doi:10.3390/ijerph182413199
4	Horibe Y, Ueda T, Watanabe Y, et al. A 2-year longitudinal study of the relationship between masticatory function and progression to frailty or pre-frailty among community-dwelling Japanese aged 65 and older. <i>J of Oral Rehabilitation</i> . 2018;45(11):864-870. doi:10.1111/joor.12700
5	Akema S, Mameno T, Nakagawa T, et al. Relationship between occlusal force and psychological frailty in Japanese community-dwelling older adults: The Septuagenarians, Octogenarians, Nonagenarians Investigation with Centenarians study. <i>J American Geriatrics Society</i> . 2023;71(6):1819-1828. doi:10.1111/jgs.18239
6	Tanaka T, Takahashi K, Hirano H, et al. Oral frailty as a risk factor for physical frailty and mortality in community-dwelling elderly. <i>The Journals of Gerontology: Series A</i> . 2018;73(12):1661-1667. doi:10.1093/gerona/glx225
7	Iwasaki M, Yoshihara A, Sato N, et al. A 5-year longitudinal study of association of maximum bite force with development of frailty in community-dwelling older adults. <i>J of Oral Rehabilitation</i> . 2018;45(1):17-24. doi:10.1111/joor.12578
8	Okura M, Ogita M, Yamamoto M, Nakai T, Numata T, Arai H. Self-assessed kyphosis and chewing disorders predict disability and mortality in community-dwelling older adults. <i>J Am Med Dir Assoc</i> . 2017;18(6):550.e1-550.e6. doi:10.1016/j.jamda.2017.02.012
9	Watanabe Y, Hirano H, Arai H, et al. Relationship between frailty and oral function in community-dwelling elderly adults. <i>J American Geriatrics Society</i> . 2017;65(1):66-76. doi:10.1111/jgs.14355

(サルコペニア)

①既存の系統的レビュー・メタ解析・統合解析

1	Fan Y, Shu X, Leung KCM, Lo ECM. Associations of general health conditions with masticatory performance and maximum bite force in older adults: A systematic review of cross-sectional studies. <i>Journal of Dentistry</i> . 2022;123:104186. doi:10.1016/j.jdent.2022.104186
2	Lee DW, Yoo JI. Association between masticatory function and sarcopenia in elderly people: a systematic review and meta-analysis. <i>International Journal of Gerontology</i> . 2020;14(3):238-244. doi:10.6890/IJGE.202008_14(3).0017

②日本人の個別研究

3	Murakami M, Hirano H, Watanabe Y, Sakai K, Kim H, Katakura A. Relationship between chewing ability and sarcopenia in Japanese community-dwelling older adults. <i>Geriatrics Gerontology Int</i> . 2015;15(8):1007-1012. doi:10.1111/ggi.12399
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4	Abe T, Tominaga K, Ando Y, et al. Number of teeth and masticatory function are associated with sarcopenia and diabetes mellitus status among community-dwelling older adults: A Shimane CoHRE study. Fürnsinn C, ed. PLoS ONE. 2021;16(6):e0252625. doi:10.1371/journal.pone.0252625
5	稲田さくら. 口腔状態とサルコペニアとの関連についての横断研究. 2024. doi:10.5834/jdh.74.1_21
6	Tanaka T, Takahashi K, Hirano H, et al. Oral frailty as a risk factor for physical frailty and mortality in community-dwelling elderly. The Journals of Gerontology: Series A. 2018;73(12):1661-1667. doi:10.1093/gerona/glx225
7	Kugimiya Y, Iwasaki M, Ohara Y, et al. Relationship between oral hypofunction and sarcopenia in community-dwelling older adults: the otassha study. IJERPH. 2021;18(12):6666. doi:10.3390/ijerph18126666

(サルコペニア)

■メタ解析、系統的レビュー

Reference			Design						Relative risk (95% CI or p)	Magnitude of association	
Author	Title	Year	First author	Year	n	Study period	Study location	Category			
Dae-Woo Lee , Jun-Il Yoo	Association between Masticatory Function and Sarcopenia in Elderly People: A Systematic Review and Meta-Analysis	2020	Murakami et al.,	2015	761	-	japan	cross-sectional	Objective masticatory function (color changing chewing gum)	3.39 (2.13, 5.39)	
			Tanaka et al.,	2017	1216	-	japan	cross-sectional		1.56 (0.87, 2.80)	
								Overall		2.34 (1.09, 5.02)	↑ ↑ ↑
			Tanaka et al.,	2017	1216	-	japan	cross-sectional	Subjective masticatory function	2.27 (1.28, 4.01)	
			Tanimoto et al.	2013	1074	-	japan	cross-sectional	(difficulties in eating score)	2.20 (1.56, 3.10)	
								Overall		2.21 (1.65, 2.97)	↑ ↑ ↑
			Murakami et al.,	2015			japan			SMD 0.426	
			Tanaka et al.,	2017			japan		Maximum occlusal force	SMD 0.172 (-0.151, 0.495)	
										SMD 0.356 (0.187, 0.526)	
								Overall			

(サルコペニア)

■コホート研究

Reference			Study subjects						Category	Number among cases	Relative risk (95%CI or p)	P for trend	Confounding variables considered	Magnitude of association
Author	Title	Year	Study period	Number of subjects	Source of subjects	Event followed	Number of incident cases or deaths	Participant's race						
Tanaka T, et al.	Oral Frailty as a Risk Factor for Physical Frailty and Mortality in Community-Dwelling Elderly (※提言掲載論文)	2018	2012-2016	n=2011	community-dwelling elderly individuals (65 years old and over)	sarcopenia	83/1151	japanese	Chewing ability(<Q1/5 : M, 14.2; W, 10.8)		Cox proportional hazard model		age, sex, BMI, chronic conditions, depressive symptoms, cognitive function, living arrangement, yearly income, and smoking behavior; participants having baseline outcomes were excluded from each analysis.	
						sarcopenia			sarcopenia not onset	18%		p=0.070		
						sarcopenia			sarcopenia onset	26%				
						sarcopenia			oral frailty status				age, sex, BMI, chronic conditions, depressive symptoms, cognitive	
									Non-oral frail (0/6)	N/A	Ref		oral frail (i) the number of natural teeth, (ii) chewing ability , (iii) articulatory oral motor skill for "ta," (iv) tongue pressure, (v) subjective difficulty in eating tough foods, and (vi) subjective difficulty in swallowing.oral	
									Pre-oral frail (1-2/6)	N/A	HR = 1.85 (0.95-3.58)	p = .070		
									Oral Frail (≥3/6)	N/A	HR = 2.13 (1.05-4.58)	p = .032		

■横断研究

Reference			Study subjects						Category	Number among cases	Relative risk (95%CI or p)	P for trend	Confounding variables considered	Magnitude of association
Author	Title	Year	Study period	Number of subjects	Source of subjects	Event followed	Number of incident cases or deaths	Participant's race						
Murakami M., et al	Relationship between chewing ability and sarcopenia in Japanese community-dwelling older adults(※316提言記載論文)	2015	-	n=761	community-dwelling people	sarcopenia		japanese	Occlusal force		OR (95%CI) OR 1.00 (1.00-1.00) OR 2.18 (1.21-3.93)	p=0.007 p=0.010	sex, height, oral wetness, Tongue-lip motor function, Tongue pressure, Swallowing function, Number of remaining teeth	↑ ↑ ↑
Abe T., et al	Number of teeth and masticatory function are associated with sarcopenia and diabetes mellitus status among community-dwelling older adults: A Shimane CoHRE study	2021	-	n=635	community-dwelling Japanese adults	sarcopenia		japanese	Masticatory function		OR(95%CI) Handgrip strength N/A 0.965 (0.941-0.990) Skeletal muscle mass N/A 0.982 (0.960-1.004) Calf circumference N/A 0.986 (0.970-1.001) Possible sarcopenia 20(3.2%) 0.941 (0.904-0.979)		sex, age, body mass index, smoking, alcohol consumption, physical activity, diabetes mellitus status	↓ ↓
稲田さくら	口腔状態とサルコペニアとの関連についての横断研究	2024	-	n=50	大学病院歯科受診者	サルコペニア		日本人				χ二乗検定		

咬合力 (N)
 (非サルコ群/サルコ群) n=33/n=17 433.2 / 449.2 p = 0.630
 咀嚼機能 (mg/dL)
 (非サルコ群/サルコ群) 202.5 / 207.8 p = 0.766

Kugimiya Y., Hypofunction and Sarcopenia in Community-Dwelling Older Adults:	Relationship between Oral Hypofunction and Sarcopenia in Community-Dwelling Older Adults:	2021 -	n=878	community-dwelling older adults	sarcopenia	japanese	Reduced occlusal force		chi-squaretest.	
							Robust /	256/715		35.8%
							Sarcopenia	96/163	58.9%	
							Decreased masticatory function			
							Robust /	123/715	17.2%	p<0.001
							Sarcopenia	68/163	41.7%	

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■コホート研究

Reference		Study subjects							Category	Number among cases	Relative risk (95%CI or p)	P for trend	Confounding variables considered	Magnitude of association
Author	Title	Year	Study period	Number of subjects	Source of subjects	Event followed	Number of incident cases or deaths	Participant's race						
Horibe Y., et al	A 2-year longitudinal study of the relationship between masticatory function and progression to frailty or pre-frailty among community-dwelling Japanese aged 65 and older →横断研究2の、コホートバージョン	2018	2013-2015	n=418	community-dwelling Japanese aged 65 and older (attended the health check-up in both 2013 and 2015)	Improving/stable group(pre frail or frail)	111/418	japanese	Self-reported chewing ability : poor(主観的咀嚼能力)	N/A	OR 0.59(0.36-0.99)	p=0.04	age, sex, remaining teeth, walking speed, MMSE, SDS, number of medications taken	↓
									mixing ability(客観的咀嚼力)	N/A	OR 1.49(1.14-1.96)	p<0.01		↓
									Occlusal force (咬合力)	N/A	OR 1.00(0.99-1.00)	p=0.30		
Tanaka T, et al.	Oral Frailty as a Risk Factor for Physical Frailty and Mortality in Community-Dwelling Elderly (※提言掲載論文)	2018	2012-2016	n=2011	community-dwelling elderly individuals (65 years old and over)	Physical frailty	83/1151	japanese	Chewing ability(<Q1/5 : M, 14.2; W, 10.8)		Cox proportional hazard model	p=0.047	age, sex, BMI, chronic conditions, depressive symptoms, cognitive function, living arrangement, yearly income, and smoking behavior; participants having baseline outcomes were excluded from each analysis.	
									Physical frailty not onset	18%				
									Physical frailty onset	25%				
Iwasaki M., et al	A 5-year longitudinal study of association of maximum bite force with development of frailty in community-dwelling older adults.	2018	1998-2008	n = 322	community-dwelling older adults	frailty	49/322	japanese	maximum bite force (MBF)		Cox proportional hazard regression analysis	p=0.02	sex, income, education level, smoking status, BMI, depression, diabetes, CVD, and the Eichner index	
									Upper tertile 9/105	Ref				
									Middle tertile 13/106	HR 1.27 (0.50-3.20)	p=0.61			↑ ↑ ↑
Mikura M., et al	Self- assessed kyphosis and chewing disorders predict disability and mortality in community- dwelling	2017	2013-3 years	n = 5083	community-dwelling adults aged 65 years or	Frailty	1630/5083	japanese	Kyphosis and poor chewing ability (BB)	N/A	Ref		age, sex	
									Poor chewing ability vs good chewing ability	N/A	OR 0.38(0.32-0.44)	↓ ↓ ↓		
									No kyphosis and good chewing ability (GG)	N/A	OR 0.16 (0.13-0.20)	↓ ↓ ↓		

■横断研究

Reference	Study subjects
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Author	Title	Year	Study period	Number of subjects	Source of subjects	Event followed	Number of incident cases or deaths	Participant's race	Category	Number among cases	Relative risk (95%CI or p)	P for trend	Confounding variables considered	<u>Magnitude of association</u>	
Horibe Y., et al	Relationship between masticatory function and frailty in community-dwelling Japanese elderly	2018	-	n= 659	community dwelling Japanese	frailty or pre-frail		japanese	Maximum occlusal force decline		OR(95%CI)				
										Robust	Ref				
										Pre-frail	1.35 (0.83–2.17)	p= 0.22			
										frail	2.02 (1.04–3.91)	p= 0.04			↑ ↑ ↑
									Mixing ability decline						
										Robust	Ref				
										Pre-frail	1.66 (1.02–2.70)	p= 0.04			↑ ↑
										frail	1.91 (0.96–3.77)	p= 0.06			↑ ↑
Akema S., et al	Relationship between occlusal force and psychological frailty in Japanese community-dwelling older adults: The Septuagenarians, Octogenarians, Nonagenarians Investigation with Centenarians study.	2023	-	n=1810	community-dwelling older adults		180/1810	japanese	Self-reported chewing ability decline						
										Robust	Ref				
										Pre-frail	2.42 (1.59–3.70)	p < 0.01			↑ ↑ ↑
										frail	5.61(3.05–10.33)	p < 0.01			↑ ↑ ↑
	psychological robustness														
	psychological frailty									Ref					
										-72.7(-125.9 - 19.4)	p<0.01				