

DAFTAR PUSTAKA

1. United Nation. World population ageing 2015. New York: Department of Economic and Social Affairs Population Division; 2015
2. Sunusi M. Intergenerational family and community support: implication to social participation and contribution of older person. The 12th ASEAN & Japan High Level Official Meeting on Caring Societies. 2014
3. Bergman H, Karunananthan S, Robledo LM, Brodsky J, Chan P, Cheung M et al. Understanding and meeting the needs of the older population: a global challenge. *Can Geriatr J.* 2013; 16(2): 61–5
4. Madyaningrum E, Chuang YC, Chuang KY. Factor associated with the use of outpatient services among the elderly in Indonesia. *BMC Health Serv Res.* 2018; 18: 707. 1–9
5. Badan Pusat Statistik Provinsi Sumatera Barat. Statistik Daerah Provinsi Sumatera Barat. 2014
6. Undang-Undang Republik Indonesia No 13 Tahun 1998 tentang Kesejahteraan Usia Lanjut
7. Ritch A. History of geriatric medicine: from Hippocrates to Marjory Warren. *J R Coll Physician Edinb.* 2012; 42:368–74
8. Soejono C. Pengkajian paripurna pada pasien geriatri. Dalam : Setiati S, Alwi I, Sudoyo AW, Simadibrata M, Setiyohadi B, Syam AF, editor. Buku ajar ilmu penyakit dalam. Edisi ke-6. Jakarta: Pusat Penerbitan Ilmu Penyakit Dalam FKUI; 2014: 3705–13
9. Pelayanan Geriatri. Standar Nasional Akreditasi Rumah Sakit: Program Nasional Sasaran V. 2018

10. Menteri Kesehatan Republik Indonesia. Penyelenggaraan Pelayanan Geriatri di Rumah Sakit. Peraturan Menteri Kesehatan Republik Indonesia Nomor 79 Tahun 2014
11. Cruz-Jentoft AJ, Landi F, Topinkova E, Michel JP. Understanding sarcopenia as a geriatric syndrome. *Current Opinion in Clinical Nutrition and Metabolic Care Journal*. 2010; 13:1–7
12. Cruz-Jentoft A J, Baeyens JP, Bauer JM, Boirie Y, Cederholm T, Landi F et al. Sarcopenia: European consensus on definition and diagnosis. Report of the European Working Group on Sarcopenia in older people. *Age and Ageing Journal*. 2010; 39: 412–23
13. Brotto M, Abreu EL. Sarcopenia: Pharmacology of today and tomorrow. *The Journal of Pharmacology and Experimental Therapeutics. JPET Journal*. 2012; 343: 540–6
14. Mayhew AJ, Amog K, Phillip S, Parise G, McNicholas PD, De-Souza RJ et al. The prevalence of sarcopenia in community dwelling older adults, an exploration of difference between studies and within definitions: a systematic review and meta-analyses. *Age and Ageing Journal*. 2018; 0: 1–9
15. Scharf G, Heineke J. Finding good biomarkers for sarcopenia. *J Cachexia Sarcopenia Muscle*. 2012; 3:145–8
16. Wang C, Bai L. Sarcopenia in the elderly: Basic and Clinical Issues. *Geriatric Gerontology International Journal*. 2012; 851: 1–9
17. Liu P, Hao Q, Hai S, Wang H, Cao L, Dong B. Sarcopenia as a predictor of all-cause mortality among community-dwelling older people: A systematic review and meta-analysis. *Elsevier Journal*. 2017; 103: 16–22
18. Landi F, Cruz-Jentoft AJ, Liperoti R, Russo A, Giovanni S, Tosato M et al. Sarcopenia and mortality risk in frail older person aged 80 years and

older: results from ilSIRENTE study. *Age and Ageing Journal*. 2013; 42: 203–9

19. Leger B, Derave W, Bock KD, Hespel P, Russell AP. Human sarcopenia reveals an increase in SOCS-3 and Myostatin and a reduced efficiency of Akt phosphorylation. *Rejuvenation Research Journal*. 2008; 11: 1–15
20. McKay BR, Ogborn DI, Bellamy LM, Tarnopolsky MA, Parise G. Myostatin is associated with age-related human muscle stem cell dysfunction. *The FASEB Journal*. 2012; 26: 2509–21
21. Nishikawa H, Enomoto H, Ishii A, Iwata Y, Miyamoto Y, Ishii Noriko et al. Elevated serum Myostatin level is associated with worse survival in patients with liver cirrhosis. *Journal of Cachexia, Sarcopenia and muscle*. 2017; 8: 915–25
22. Peng LN, Lee WJ, Lin MH, Chen LK. Healthy community-living older men differ from women in association between Myostatin levels and skeletal muscle mass. *Journal of Cachexia, Sarcopenia and Muscle*. 2018; 10: 1–8
23. Yarasheski KE, Bhasin SH, Hikim IS, Loduca JP, Cadavid NFG. Serum Myostatin-immunoreactive protein is increased in 69-92 year old women and men with muscle wasting. *The Journal of Nutrition, Health & Aging*. 2002; 6: 1–6
24. Morley JE. Sarcopenia in the elderly. *Family practice journal*. Oxford University Press. 2012; 29: 144–8
25. Kwak JY, Hwang H, Kim SK, Choi JY, Lee SM, Bang H et al. Prediction of sarcopenia using a combination of multiple serum biomarkers. *Scientific Reports Journal*. 2018; 8: 1–7

26. Nielsen AR, Pedersen BK. The biological roles of exercise-induced cytokines: IL-6, IL-8 and IL-15. *Appl Physiol Nutr Metab.* 2007; 32: 833–9
27. Quinn LS, Anderson BG, Bodey LS, Hanson TW. Serum and muscle Interleukin-15 level decrease in aging mice; correlation with declines in soluble Interleukin-15 receptor alpha expression. *Exp Gerontol.* 2010; 45: 106–12
28. Yalcin A, Silay K, Balik AR, Avioglu G, Aydin AS. The relationship between plasma interleukin-15 levels and sarcopenia in outpatient older people. *Aging Clin Exp Res.* 2017; 17: 1–8
29. Paula JA, Wamser EL, Gomes ARS, Valderramas SR, Neto JC, Schieferdecker ME. Analysis of methods for detecting sarcopenia in independent community-dwelling elderly women. *Rev. Bras. Geriatr Gerontology.* 2016; 19: 235–46
30. Kalinkovich A, Livshits G. Sarcopenia – The search for emerging biomarkers. *Ageing Research Reviews, Elsevier Journal.* 2015; 22: 58–71
31. Lera L, Albala C, Sanchez H, Angel B, Hormazabal MJ, Marquez et al. Prevalence of sarcopenia in community-dwelling Chilean elders according to an adapted version of The European Working Group on Sarcopenia in Older People (EWGSOP) Criteria. *The Journal of Frailty & Aging.* 2017; 6: 12–7
32. Santili V, Bernetti A, Mangone M, Paoloni M. Clinical definition of sarcopenia. *Clinical Case in Mineral and Bone Metabolism Journal.* 2014; 11: 177–80
33. Wu CH, Chen KT, Hou MT, Chang YF, Chang CS, Liu PY et al. Prevalence and associated factors of sarcopenia and severe sarcopenia in older Taiwanese living in rural community: The Tianliao Old People Study 04. *Geriatric Gerontology Journal.* 2014; 1: 69–75

34. Vitriana, Defi IR, Nugraha GI, Setiabudiawan B. Prevalensi sarkopenia pada lansia di komunitas (community dwelling) berdasarkan dua nilai cut-off parameter diagnosis. MKB. 2016; 48: 164–70
35. Ogawa S, Yakabe M, Akishita M. Age-related sarcopenia and its pathophysiological bases. BioMed Central Journal. 2016; 36: 1–6
36. Franceschi C, Bonafe M, Valensin S, Olivieri F, De Luca M, Ottaviani E et al. Inflamm-aging. An evolutionary perspective on immunosenescence. Ann N Y Acad Sci. 2000; 908: 244–54
37. Gomes MJ, Martinez FP, Pagan LU, Damatto RL, Cezar MD, Lima AR et al. Skeletal muscle aging: influence of oxidative stress and physical exercise. Impact Journal Oncotarget. 2017; 8: 20428–40
38. Ali S, Garcia JM. Sarcopenia, cachexia and aging: diagnosis, mechanism and therapeutic option – a mini-review. Gerontology Journal. 2014; 60: 294–305
39. Thomas M, Langley B, Berry C, Sharma M, Kirk S, Bass J et al. Myostatin a negative regulator of muscle growth, function by inhibiting myoblast proliferation. The Journal of Biological Chemistry. 2000; 275: 40235–43
40. Sharma M, McFarlane C, Kambadur R, Kukreti H, Bonala S, Srinivasan S. Myostatin: expanding horizons. International Union of Biochemistry and Molecular Biology Journal. 2015; 67: 589–600
41. Liu W, Thomas SG, Asa SL, Gonzales-Cadavid N, Bhasin S, Ezzat S. Myostatin is a skeletal muscle target of growth hormone anabolic action. The Journal of Endocrinology & Metabolism. 2003; 88(11): 5940–96
42. Huang Z, Chen X, Chen D. Myostatin: a novel insight into its role in metabolism, signal pathways and expression regulation. Cellular signaling Journal. 2011; 23: 1441–6

43. Carnac G, Vernus B, Bonniieu A. Myostatin in the Pathophysiology of skeletal muscle. *Current Genomic Journal*. 2007; 8: 415–22
44. Brandt C, Nielsen AR, Fischer CP, Hansen J, Pedersen BK, Plomgaard P. Plasma and muscle Myostatin in relation to type 2 diabetes. *PLoS ONE Journal*. 2012; 7: 1–7
45. Siriatt V, Platt L, Salerno MS, Ling N, Kambadur R, Sharma M. Prolonged absence of Myostatin reduces sarcopenia. *Journal of Cellular Physiology*. 2006; 209: 866–73
46. Elkina Y, Haehling SV, Anker SD, Springer J. The role of myostatin in muscle wasting: an overview. *J Cachexia Sarcopenia Muscle*. 2011; 2: 143–51
47. Souza VA, Oliveira D, Mansur HN, Silva NM, Bastos MG. Sarcopenia in Chronic Kidney Disease. *J Bras Nefrol*. 2015; 37(1): 98–105
48. Han DS, Chen YM, Lin SY, Chang HH, Huang TM, Chi YC et al. Serum myostatin levels and grip strength in normal subjects and patients on maintenance haemodialysis. *Clinical Endocrinology Journal*. 2011;75: 857–63
49. Hayot M, Rodriguez J, Vernus B, Carnac G, Jean E, Allen D et al. Myostatin up-regulation is associated with the skeletal muscle response to hypoxic stimuli. *Molecular and Cellular Endocrinology*. 2011; 332: 38–47
50. Santiago C, Ruiz JR, Rodriguez-Romo G, Fiuza-Luces C, Yvert T, Gonzalez-Freire M et al. The K153R Polymorphism in the myostatin gene and muscle power phenotypes in young, non-athletic men. *PLoS ONE Journal*. 2011; 6(1): 1–5
51. Tasar PT, Sahin S, Karaman E, Oz A, Ulusoy MG, Duman S et al. Myostatin gene polymorphism in an elderly sarcopenic Turkish

- population. *Genetic Testing and Molecular Biomarkers Jurnal*. 2015; 19(8): 1–4
52. Aryana IG, Aprianta IG, Kuswardhani RA. Role of interleukin-15 in sarcopenia: future new target therapy. *Int J Geriatr Gerontol*. 2017; 2: 1–8
53. Aryana IG, Lestari AA, Putrawan IB, Purnami NK, Astika IN, Kuswardhani RA. The relationship between IL-6 and CRP with sarcopenia in indigenous elderly population at Pedawa Village, Buleleng, Bali, Indonesia. *Health Science Journal of Indonesia*. 2018; 9: 37–44
54. Bano G, Trevisan C, Carraro S, Solmi M, Luchini C, Stubbs B et al. Inflammation and sarcopenia: a systematic review and meta-analysis. *Maturitas Journal*. 2017; 96: 10–15
55. O’Leary MF, Wallace GR, Bennett AJ, Tsintzas K, Jones SW. IL-15 promotes human myogenesis and mitigates the detrimental effects of TNF- α on myotubes development. *Scientific Report Journal*. 2017; 7: 1–11
56. Vasconcelos ED, Salla RF. Role of interleukin-6 and interleukin-15 in exercise. *MOJ Immunol*. 2018; 6: 1–3
57. Hyödynmaa J. Effect of intrinsic aerobic capacity, aging and physical activity on Interleukin-15 protein level in serum and skeletal muscle. *Spring Exercise Physiol*. 2015; 1: 1–17
58. Quinn LS, Anderson BG, Strait-Bodey L, Strout AM, Argilles JM. Oversecretion of interleukin-15 from skeletal muscle reduces adiposity. *Am J Physiol Endocrinol Metab*. 2009; 296: 191–202
59. Marzetti E, Carter CS, Wohlgemuth SE, Lees AH, Giovannini S, Anderson B *et al*. Changes in IL-15 expression and death-receptor apoptotic signalling in rat gastrocnemius muscle with aging and life-long calorie restriction. *Mech Ageing Dev*. 2009; 130: 272–80

60. Bahat G, Tufan A, Tufan F, Kilic C, Akpınar TS, Kose M et al. Cut-off point to identify sarcopenia according to European Working Group on Sarcopenia in Older People (EWGSOP) definition. *Clinical Nutrition Journal*. 2016; 35: 1–30
61. Sergi G, Rui MD, Veronese N, Manzato E. Measurement of lean body mass using bioelectrical impedance analysis: a consideration of the pros and cons. *Aging Clin Exp Res*. 2016; 29: 591–7
62. Gonzales MC, Heymsfield SB. Bioelectrical impedance analysis for diagnosing sarcopenia and cachexia: what are we really estimating? *Journal of Cachexia, Sarcopenia and Muscle*. 2017; 8: 187–189
63. Chen LK, Liu LK, Woo J, Assantachai P, Auyeung TW, Bahyah KS et al. Sarcopenia in Asia: consensus report of the Asian Working Group for Sarcopenia. *Elsevier Journal*. 2014; 15: 95–101
64. Bohannon RW. Are hand-grip and knee extension strength reflective of a common construct? *Perceptual & Motor Skills*. 2012; 114(2):514–8
65. White TA, LeBrasseur NK. Myostatin and sarcopenia: opportunities and challenges – a mini review. *Gerontology Journal*. 2014; 60: 289–93
66. Fife E, Kotska J, Kroc L, Guligowska A, Piglowska M, Soltysik B et al. Relationship of muscle function to circulating myostatin, follistatin and GDF11 in older women and men. *BMC Geriatric Journal*. 2018; 18: 200–12
67. Sharp M, Lowery RP, Shields K, Ormes J, McCleary SA, Rauch J et al. The effect of a myostatin inhibitor on lean body mass, strength and power in resistance trained males. *Journal of the International Society of Sports Nutrition*. 2014; 11: 42–51

68. Bowser M, Herberg S, Arounleut P, Shi X, Fulzele S, Hill WD et al. Effect of the activin-A-myostatin-follistatin system on aging bone and muscle progenitor cells. *Exp Gerontol Journal*. 2014; 48(2): 290–7
69. Waldmann TA, Tagaya Y. The multifaceted regulation of interleukin-15 expression and the role of this cytokine in NK cell differentiation and host response to intracellular pathogens. *Annu Rev Immunol*. 1999;17:19–49
70. Shin MJ, Jeon YK, Kim IJ. Testosterone and sarcopenia. *World J Mens Health*. 2018; 36(3): 192–8
71. Pelegri A, Mazo GZ, Pinto AD, Benedetti TR, Silva DA, Petroski EL. Sarcopenia: prevalence and associated factors among elderly from a Brazilian capital. *Fisioter Mov Journal*. 2018; 31: 1–8
72. Ho AW, Lee MM, Chan EW, Ng HM, Lee CW, Ng WS et al. Prevalence of pre-sarcopenia and sarcopenia in Hongkong Chinese geriatric patients with hip fracture and its correlation with different factors. *Hong Kong Med J*. 2016; 22: 23–9
73. Sun DS, Lee H, Yim HW, Won HS, Ko YH. The impact of sarcopenia on health-related quality of life in elderly people: Korean National Health and Nutrition Examination Survey. *Korean J Intern Med*. 2019; 34(4): 877–84
74. Han DS, Chang KV, Li CM, Lin YH, Kao TW, Tsai KS et al. Skeletal muscle mass adjusted by height correlated better with muscular function than that adjusted by body weight in defining sarcopenia. *Scientific Reports Journal*. 2016; 1: 1–20
75. Planella-Farrugia C, Comas F, Sabater-Masdeu M, Moreno M, Moreno-Navarrete JM, Rovira O et al. Circulating irisin and myostatin as markers of muscle strength and physical condition in elderly subjects. *Frontiers in Physiology Journal*. 2019; 10(6): 1–12

76. Vikberg S, Sorlen N, Branden L, Johansson J, Nordstrom A, Hult A et al. Effects of resistance training on functional strength and muscle mass in 70-year-old individuals with presarcopenia: a randomized controlled trial. *JAMDA*. 2019; 1: 28–34
77. Liguori I, Russo G, Aran L, Bulli G, Curcio F, Della-Morte D et al. Sarcopenia: assessment of disease burden and strategies to improve outcomes. *Clin Interv Aging Journal*. 2018; 13: 913–27
78. Fukuoka Y, Narita T, Fujita H, Morii T, Sato T, Sassa MH et al. Importance of physical evaluation using skeletal muscle mass index and body fat percentage to prevent sarcopenia in elderly Japanese diabetes patients. *J Diabetes Investig*. 2019; 10: 322–30
79. Farmer RE, Mathur R, Schmidt AF, Bhaskaran K, Fatemifar G, Eastwood SV et al. Association between measures of sarcopenic obesity and risk of cardiovascular disease and mortality: A cohort study and Mendelian randomization analysis using the UK Biobank. *J Am Heart Assoc*. 2019; 8: 1–37
80. Szulc P, Schoppet M, Goettsch C, Rauner M, Dschietzig T, Chapurlat R et al. Endocrine and clinical correlates of myostatin serum concentration in men – the STRAMBO study. *J Clin Endocrinol Metab*. 2012; 97(10): 3700–8
81. Tay L, Ding YY, Leung BP, Ismail NH, Yeo A, Yew S et al. Sex-specific differences in risk factors for sarcopenia amongst community-dwelling older adults. *American Aging Association Journal*. 2015; 37(121): 1–12
82. Chew J, Tay L, Lim JP, Leung BP, Yeo A, Yew S et al. Serum myostatin and IGF-1 as gender-specific biomarkers of frailty and low muscle mass in community-dwelling older adults. *J Nutr Health Aging*. 2019; 6: 1–8

83. Koyun D, Nergizoglu G, Kir KM. Evaluation of the relationship between muscle mass and serum myostatin levels in chronic hemodialysis patients. *Saudi J Kidney Dis Transpl.* 2018; 29(4) 809–15
84. Martinez-Hernandez P, Hernanz-Macias A, Gomez-Candela C, Grande-Aragon C, Feliu-Batlle J, Castro-Carpeno J et al. Serum interleukin-15 levels in cancer patient with cachexia. *Oncology reports.* 2012; (28): 1443–52
85. Laksmi PW, Setiati S, Tamin TZ, Soewondo P, Rochmah W, Prihartono J et al. Effect of metformin on handgrip strength, gait speed, myostatin serum level, and health-related quality of life. *Acta Med Indones – Indones J Intern Med.* 2017; 49(4): 118–27
86. Tanaka M, Masuda S, Yamakage H, Inoue T, Ohue-Kitano R, Yokota S et al. Role of serum myostatin in the association between hyperinsulinemia and muscle atrophy in Japanese obese patients. *DRCP Journal.* 2018; 5; 1–28
87. Consitt LA, Clark BC. The vicious cycle of myostatin signaling in sarcopenic obesity: myostatin role in skeletal muscle growth, insulin signaling and implication for clinical trials. *The Journal of Frailty & Aging.* 2018; 7(1): 21–7
88. Hingorjo MR, Zehra S, Saleem S, Qureshi MA. Serum interleukin-15 and its relationship with adiposity indices before and after short-term endurance exercise. *Pak J Med Sci Journal.* 2018; 34(5): 1125–31
89. Wang J, Leung KS, Chow SK, Cheung WH. Inflammation and age-associated skeletal muscle deterioration (sarcopenia). *Journal of Orthopaedic Translation.* 2017; 1(6): 1–8
90. Aryana IG, Hapsari AA, Kuswardhani RA. Myokine regulation as marker of sarcopenia in elderly. *Mol Cell Biomed Sci.* 2018; 2(2): 38–47