

## DAFTAR PUSTAKA

- Abu Jadayil, S., Abu Jadayel, B., Takruri, H., Muwalla, M., & McGrattan, A. M. (2021). Study of the fluctuation of serum vitamin D concentration with time during the same day and night on a random sample of healthy adults. *Clinical Nutrition ESPEN*, 46, 499–504.
- Alathari, B. E., Aji, A. S., Ariyasra, U., Sari, S. R., Tasrif, N., Yani, F. F., Sudji, I. R., Lovegrove, J. A., Lipoeto, N. I., & Vimalaswaran, K. S. (2021). Interaction between vitamin D-related genetic risk score and carbohydrate intake on body fat composition: A study in Southeast Asian Minangkabau women. *Nutrients*, 13(2), 326.
- Alkan, A., & Köksoy, E. B. (2019). Vitamin D deficiency in cancer patients and predictors for screening (D-ONC study). *Current Problems in Cancer*, 43(5), 421–428.
- Amir, E., Cecchini, R. S., Ganz, P. A., Costantino, J. P., Beddows, S., Hood, N., & Goodwin, P. J. (2012). 25-Hydroxy vitamin-D, obesity, and associated variables as predictors of breast cancer risk and tamoxifen benefit in NSABP-P1. *Breast Cancer Research and Treatment*, 133(3), 1077–1088.
- Aris, N., Malaysia, U. S., Mitra, A. K., Wan Mohamed, W. M. I., Wan Muda, W. A. M., Jan Mohamed, H. J., Jackson State University, Malaysia, U. S., Khazanah Research Institute, & Malaysia, U. S. (2020). Effects of occupational sunlight exposure and monsoon season on vitamin D concentration among outdoor and indoor workers in Malaysia. *Malaysian Journal of Nutrition*, 26(3), 425–439.
- Alexandru, A., Ivan, C.-S., Tanasescu, S., Oprisoni, L. A., Dragomir, T.-L., Varga, N.-I., Mateescu, D., Diaconu, M., Margan, M.-M., & Boeriu, E. (2024). Are pediatric cancer patients a risk group for vitamin D deficiency? A systematic review. *Cancers*, 16(24).
- Altaf, S., Enders, F., Jeavons, E., Krailo, M., Barkauskas, D. A., Meyers, P., & Arndt, C. (2013). High-BMI at diagnosis is associated with inferior survival in patients with osteosarcoma: a report from the Children's Oncology Group: BMI and Survival in Osteosarcoma. *Pediatric Blood & Cancer*, 60(12), 2042–2046.

- Alvina, Jesslyn, Zita Arieselia, & Regina Regina. (2025) Self-Protection against UV Exposure: Behavioral Patterns and Phototype Correlations among Medical Students in North Jakarta, Indonesia. *Journal of Urban Health Research*, 3(3), 1-9.
- Aji, A. S., Erwinda, E., Yusrawati, Y., Malik, S. G., & Lipoeto, N. I. (2019). Vitamin D deficiency status and its related risk factors during early pregnancy: a cross-sectional study of pregnant Minangkabau women, Indonesia. *BMC Pregnancy and Childbirth*, 19(1), 183.
- Alayunt, N. Ö., & Özüdoğru, O. (2020). Changes in vitamin D levels according to age, gender and season in the siirt province. *Turkish Journal of Osteoporosis*, 26(3), 160–164.
- Alloubani, A., Akhu-Zaheya, L., Samara, R., Abdulhafiz, I., Saleh, A., & Altowijri, A. (2019). Relationship between vitamin D deficiency, diabetes, and obesity. *Diabetes & Metabolic Syndrome*, 13(2), 1457–1461
- Al-Zohily, B., Al-Menhali, A., Gariballa, S., Haq, A., & Shah, I. (2020). Epimers of vitamin D: A review. *International Journal of Molecular Sciences*, 21(2), 470.
- Bahrami, A., Sadeghnia, H. R., Tabatabaeizadeh, S.-A., Bahrami-Taghanaki, H., Behboodi, N., Esmaeili, H., Ferns, G. A., Mobarhan, M. G., & Avan, A. (2018). Genetic and epigenetic factors influencing vitamin D status. *Journal of Cellular Physiology*, 233(5), 4033–4043.
- Baumann, M., Dani, S. U., Dietrich, D., Hochstrasser, A., Klingbiel, D., Mark, M. T., Riesen, W. F., Ruhstaller, T., Templeton, A. J., & Thürlimann, B. (2018). Vitamin D levels in Swiss breast cancer survivors. *Swiss Medical Weekly*, 148, w14576.
- Barja-Fernández, S., Aguilera, C. M., Martínez-Silva, I., Vazquez, R., Gil-Campos, M., Olza, J., Bedoya, J., Cadarso-Suárez, C., Gil, Á., Seoane, L. M., & Leis, R. (2018). 25-Hydroxyvitamin D levels of children are inversely related to adiposity assessed by body mass index. *Journal of Physiology and Biochemistry*, 74(1), 111–118.
- Bhagyashree, N, Shilpasree Jana, Smitha N., Sai S. K. Goothy. 2025. A Cross-sectional Study on The Impact of Physical Activity and Body Mass Index on Vitamin D Levels among Medical Students. *Asian Journal of Pharmaceutical and Clinical Research*, 18(4), 184-187.

- Biswas, Tuhin, Nick Townsend, RJ Soares Magalhaes, Md Saimul Islam, Md Mehedi Hasan, & Abdullah Mamun. (2019) Current Progress and Future Directions in the Double Burden of Malnutrition among Women in South and Southeast Asian Countries. *Nutritional Epidemiology and Public Health*.
- Bennour, I., Haroun, N., Sicard, F., Mounien, L., & Landrier, J.-F. (2022). Vitamin D and obesity/adiposity—A brief overview of recent studies. *Nutrients*, 14(10), 2049.
- Bento-Lopes, L., Cabaço, L. C., Charneca, J., Neto, M. V., Seabra, M. C., & Barral, D. C. (2023). Melanin's journey from melanocytes to keratinocytes: Uncovering the molecular mechanisms of melanin transfer and processing. *International Journal of Molecular Sciences*, 24(14), 11289.
- Best, C. M., Zelnick, L. R., Thummel, K. E., Hsu, S., Limonte, C., Thadhani, R., Sesso, H. D., Manson, J. E., Buring, J. E., Mora, S., Lee, I.-M., Cook, N. R., Friedenberg, G., Luttmann-Gibson, H., de Boer, I. H., & Hoofnagle, A. N. (2022). Serum vitamin D: Correlates of baseline concentration and response to supplementation in VITAL-DKD. *The Journal of Clinical Endocrinology and Metabolism*, 107(2), 525–537.
- Biben, Vitriana, Irma R. Defi, Gaga I. Nugraha, & Budi Setiabudiawan. (2017). Vitamin D Status and its Impact on Body Composition in Elderly Community-dwelling Individuals in Bandung and Sumedang, West Java Province, Indonesia. *Journal of Epidemiology*, 10(2), 63-69.
- Bičíková, M., & Máčová, L. (2023). Vitamin D, a steroid hormone, from theory to practice. *Physiological Research*, 72(2), 131–136.
- Bielack, S. S., Smeland, S., Whelan, J. S., Marina, N., Jovic, G., Hook, J. M., Krailo, M. D., Gebhardt, M., Pápai, Z., Meyer, J., Nadel, H., Randall, R. L., Deffenbaugh, C., Nagarajan, R., Brennan, B., Letson, G. D., Teot, L. A., Goorin, A., Baumhoer, D., ... EURAMOS-1 investigators. (2015). Methotrexate, doxorubicin, and cisplatin (MAP) plus maintenance pegylated interferon Alfa-2b versus MAP alone in patients with resectable high-grade osteosarcoma and good histologic response to preoperative MAP: First results of the EURAMOS-1 good response randomized controlled trial. *Journal of Clinical Oncology: Official Journal of the American Society of Clinical Oncology*, 33(20), 2279–2287.

- Bikle, D. D. (2007). Vitamin D insufficiency/deficiency in gastrointestinal disorders. *Journal of Bone and Mineral Research: The Official Journal of the American Society for Bone and Mineral Research*, 22(S2), V50–V54.
- Blay, J.-Y., Penel, N., Toulmonde, M., Valentin, T., Chaigneau, L., Rios, M., Saada-Bouazid, E., Firmin, N., Bertucci, F., Marec-Berard, P., Ray-Coquard, I., Lervat, C., Rolland, F., Thyss, A., Conroy, T., Brahmi, M., Dufresne, A., Merrouche, Y., Brunat-Mentigny, M., ... French Sarcoma Group. (2024). Long term survival in adult osteosarcoma patients treated with a two-drug regimen: Final results of the OSAD93 phase II study of the FSG-GETO. *European Journal of Cancer* (Oxford, England: 1990), 208(114228), 114228.
- Bouillon, R., Schuit, F., Antonio, L., & Rastinejad, F. (2020). Vitamin D binding protein: A historic overview. *Frontiers in Endocrinology*, 10.
- Bujang, M. A. (2024). An elaboration on sample size determination for correlations based on effect sizes and confidence interval width: a guide for researchers. *Restorative Dentistry & Endodontics*, 49(2), e21.
- Bunch, B. L., Ma, Y., Attwood, K., Amable, L., Luo, W., Morrison, C., Guru, K. A., Woloszyńska-Read, A., Hershberger, P. A., Trump, D. L., & Johnson, C. S. (2019). Vitamin D(3) enhances the response to cisplatin in bladder cancer through VDR and TAp73 signaling crosstalk. *Cancer Medicine*, 8(5), 2449–2461.
- Capobianco, E., McGaughey, V., Seraphin, G., Heckel, J., Rieger, S., & Lisse, T. S. (2023). Vitamin D inhibits osteosarcoma by reprogramming nonsense-mediated RNA decay and SNAI2-mediated epithelial-to-mesenchymal transition. *Frontiers in Oncology*, 13.
- Caprio, M., Infante, M., Calanchini, M., Mammi, C., & Fabbri, A. (2017). Vitamin D: not just the bone. Evidence for beneficial pleiotropic extraskeletal effects. *Eating and Weight Disorders: EWD*, 22(1), 27–41.
- Carboo, J. A., Dolman-Macleod, R. C., Uyoga, M. A., Nienaber, A., Lombard, M. J., & Malan, L. (2023). The relationship between serum 25-hydroxyvitamin D and iron status and anaemia in undernourished and non-undernourished children under five years in South Africa. *Human Nutrition & Metabolism*, 200224, 200224.

- Carboo, J. A., Malan, L., Lombard, M. J., & Dolman-Macleod, R. C. (2023). Vitamin D status in relation to systemic and intestinal inflammation in undernourished children, 6–59 months old: Design and rationale of a non-controlled open label trial. *Human Nutrition & Metabolism*, 31(200181), 200181
- Cardoso, S., Santos, A., Guerra, R. S., Sousa, A. S., Padrão, P., Moreira, P., Afonso, C., Amaral, T. F., & Borges, N. (2017). Association between serum 25-hydroxyvitamin D concentrations and ultraviolet index in Portuguese older adults: a cross-sectional study. *BMC Geriatrics*, 17(1), 256.
- Carmeliet, G., Dermauw, V., & Bouillon, R. (2015). Vitamin D signaling in calcium and bone homeostasis: A delicate balance. *Bailliere's Best Practice & Research. Clinical Endocrinology & Metabolism*, 29(4), 621–631.
- Chandler, P. D., Chen, W. Y., Ajala, O. N., Hazra, A., Cook, N., Bubes, V., Lee, I.-M., Giovannucci, E. L., Willett, W., Buring, J. E., Manson, J. E., & VITAL Research Group. (2020). Effect of vitamin D3 supplements on development of advanced cancer: A secondary analysis of the VITAL randomized clinical trial: A secondary analysis of the VITAL randomized clinical trial. *JAMA Network Open*, 3(11), e2025850.
- Charoenngam, N., Shirvani, A., & Holick, M. F. (2019). Vitamin D for skeletal and non-skeletal health: What we should know. *Journal of Clinical Orthopaedics and Trauma*, 10(6), 1082–1093.
- Chauhan, K., Shahrokhi, M., & Huecker, M. R. (2025). Vitamin D. *In StatPearls*. StatPearls Publishing.
- Charehbili, A., Hamdy, N. A. T., Smit, V. T. H. B. M., Kessels, L., van Bochove, A., van Laarhoven, H. W., Putter, H., Meershoek-Klein Kranenbarg, E., van Leeuwen-Stok, A. E., van der Hoeven, J. J. M., van de Velde, C. J. H., Nortier, J. W. R., Kroep, J. R., & Dutch Breast Cancer Research Group (BOOG). (2016). Vitamin D (25-OH D3) status and pathological response to neoadjuvant chemotherapy in stage II/III breast cancer: Data from the NEOZOTAC trial (BOOG 10-01). *Breast*, 25, 69–74.
- Charlton, M., Stanley, S. A., Whitman, Z., Wenn, V., Coats, T. J., Sims, M., & Thompson, J. P. (2020). The effect of constitutive pigmentation on the measured emissivity of human skin. *PloS One*, 15(11), e0241843.

- Chen, C.-H., Liu, L.-K., Chen, M.-J., Lee, W.-J., Lin, M.-H., Peng, L.-N., & Chen, L.-K. (2018). Associations between vitamin D deficiency, musculoskeletal health, and cardiometabolic risk among community-living people in Taiwan: Age and sex-specific relationship: Age and sex-specific relationship. *Medicine*, *97*(52), e13886.
- Cheng, H. M., Mah, K. K., & Seluakumaran, K. (2020). Fat digestion: Bile salt, emulsification, micelles, lipases, chylomicrons. *In* *Defining Physiology: Principles, Themes, Concepts. Volume 2* (pp. 63–65). Springer International Publishing.
- Christopher, K. L., Wiggins, A. T., Van Meter, E. M., Means, R. T., Jr, Hayslip, J. W., & Roach, J. P. (2013). Differences in vitamin D nutritional status between newly diagnosed cancer patients from rural or urban settings in Kentucky. *Nutrition and Cancer*, *65*(5), 653–658.
- Chun, R. F., Shieh, A., Gottlieb, C., Yacoubian, V., Wang, J., Hewison, M., & Adams, J. S. (2019). Vitamin D binding protein and the biological activity of vitamin D. *Frontiers in Endocrinology*, *10*.
- Ciarambino, T., Crispino, P., Minervini, G., & Giordano, M. (2023). Vitamin D: Can gender medicine have a role? *Biomedicines*, *11*(6).
- Cui, A., Zhang, T., Xiao, P., Fan, Z., Wang, H., & Zhuang, Y. (2023). Global and regional prevalence of vitamin D deficiency in population-based studies from 2000 to 2022: A pooled analysis of 7.9 million participants. *Frontiers in Nutrition*, *10*.
- Dahlan, M. S. (2010). *Besar Sampel dan Cara Pengambilan Sampel dalam Penelitian Kedokteran dan Kesehatan*. Jakarta: Salemba Medika.
- Damayanti, Amilia Y., Dono Indarto, Brian Wasita, & Tonang D. Ardyanto. (2017). Indeks massa tubuh, asupan vitamin D, dan serum 25-hydroxyvitamin D pada pasien kanker payudara. *Jurnal Gizi Klinik Indonesia*, *14* (2), 56-63.
- Daryabor, G., Gholijani, N., & Kahmini, F. R. (2023). A review of the critical role of vitamin D axis on the immune system. *Experimental and Molecular Pathology*, *132–133*(104866), 104866.
- Delle Monache, S., Di Fulvio, P., Iannetti, E., Valerii, L., Capone, L., Nespoli, M. G., Bologna, M., & Angelucci, A. (2018). Body mass index represents a good predictor of vitamin D status in women independently from age. *Clinical Nutrition*, *38*(2), 829–834.

- Delrue, C., Speeckaert, R., Delanghe, J. R., Prytuła, A., & Speeckaert, M. M. (2024). Investigating vitamin D-binding protein's role in childhood health and development. *International Journal of Molecular Sciences*, 25(11), 6272.
- Dieny, F. F., Rose, S., & Tsani, A. F. A. (2022). Body Mass Index is the most associated anthropometry indicators of obesity with Insulin Resistance in female college students. *Jurnal Gizi Indonesia*, 11(1), 66–76.
- Divakar, U., Sathish, T., Soljak, M., Bajpai, R., Dunleavy, G., Visvalingam, N., Nazeha, N., Soh, C. K., Christopoulos, G., & Car, J. (2019). Prevalence of vitamin D deficiency and its associated work-related factors among indoor workers in a multi-ethnic southeast Asian country. *International Journal of Environmental Research and Public Health*, 17(1), 164
- Du, M., Chang, C., Zhang, X., Zhang, Y., Radford, M. J., Gahler, R. J., Kuo, Y. C., Wood, S., & Solnier, J. (2023). Designing Vitamin D3 formulations: An in vitro investigation using a novel micellar delivery system. *Nutraceuticals*, 3(2), 290–305.
- Drobotun, O. V., M. K. Ternovy , & M. M. Kolotilov. (2023). Serum vitamin D in patients with benign, primary malignant and metastatic bone tumors. *Orthopaedics, traumatology and prosthetics*, 2.
- Fernando, M., Ellery, S. J., Marquina, C., Lim, S., Naderpoor, N., & Mousa, A. (2020). Vitamin D-binding protein in pregnancy and reproductive health. *Nutrients*, 12(5), 1489.
- Fiamenghi, V. I., & Mello, E. D. de. (2021). Vitamin D deficiency in children and adolescents with obesity: a meta-analysis. *Jornal de Pediatria*, 97(3), 273–279.
- Galus, Ł., Michalak, M., Lorenz, M., Stoińska-Swiniarek, R., Tusień Małecka, D., Galus, A., Kolenda, T., Leporowska, E., & Mackiewicz, J. (2023). Vitamin D supplementation increases objective response rate and prolongs progression-free time in patients with advanced melanoma undergoing anti-PD-1 therapy. *Cancer*, 129(13), 2047–2055.
- Girgis, C. M., Clifton-Bligh, R. J., Hamrick, M. W., Holick, M. F., & Gunton, J. E. (2013). The roles of vitamin D in skeletal muscle: Form, function, and metabolism. *Endocrine Reviews*, 34(1), 33–83.

- Goyal, A., Anastasopoulou, C., Ngu, M., & Singh, S. (2025). Hypocalcemia. *In* StatPearls. StatPearls Publishing.
- Gupta, V., & Sharma, V. K. (2019). Skin typing: Fitzpatrick grading and others. *Clinics in Dermatology*, 37(5), 430–436.
- Gwenzi, T., Zhu, A., Schrotz-King, P., Schöttker, B., Hoffmeister, M., & Brenner, H. (2023). Effects of vitamin D supplementation on inflammatory response in patients with cancer and precancerous lesions: Systematic review and meta-analysis of randomized trials. *Clinical Nutrition (Edinburgh, Scotland)*, 42(7), 1142–1150.
- Hakeem, S., Mendonca, N., Aspray, T., Kingston, A., Ruiz-Martin, C., Jagger, C., Mathers, J. C., Duncan, R., & Hill, T. R. (2020). The association between 25-hydroxyvitamin D concentration and disability trajectories in very old adults: The Newcastle 85+ Study. *Nutrients*, 12(9).
- Hartati, T. S. P., & Isaura, E. R. (2023). Three body mass index classification comparison in predicting hypertension among middle-aged Indonesians. *Media Gizi Indonesia*, 18(1), 38–48.
- Haussler, M. R., Whitfield, G. K., Kaneko, I., Haussler, C. A., Hsieh, D., Hsieh, J.-C., & Jurutka, P. W. (2013). Molecular mechanisms of vitamin D action. *Calcified Tissue International*, 92(2), 77–98.
- Heaney, R. P., Horst, R. L., Cullen, D. M., & Armas, L. A. G. (2009). Vitamin D3 distribution and status in the body. *Journal of the American College of Nutrition*, 28(3), 252–256.
- Hingorani, P., Seidel, K., Krailo, M., Mascarenhas, L., Meyers, P., Marina, N., Conrad, E. U., & Hawkins, D. S. (2011). Body mass index (BMI) at diagnosis is associated with surgical wound complications in patients with localized osteosarcoma: a report from the Children's Oncology Group: BMI and Wound Complications in Osteosarcoma. *Pediatric Blood & Cancer*, 57(6), 939–942.
- He, H., Zeng, Y., Wang, X., Yang, L., Zhang, M., & An, Z. (2020). Meteorological condition and air pollution exposure associated with vitamin D deficiency: A cross-sectional population-based study in China. *Risk Management and Healthcare Policy*, 13, 2317–2324.
- Holzer, G., Hobusch, G., Hansen, S., Fischer, L., & Patsch, J. M. (2021). Is there an association between bone microarchitecture and fracture in patients

- who were treated for high-grade osteosarcoma? A controlled study at long-term follow-up using high-resolution peripheral quantitative CT. *Clinical Orthopaedics and Related Research*, 479(11), 2493–2501.
- Horas, K., Maier, G., Jakob, F., Maus, U., Kurth, A., Jakuscheit, A., Rudert, M., & Holzapfel, B. M. (2017). High prevalence of vitamin D deficiency in patients with bone tumors. *Cancer Investigation*, 35(8), 562–568.
- Horas, K., van Herck, U., Maier, G. S., Maus, U., Harrasser, N., Jakob, F., Weissenberger, M., Arnholdt, J., Holzapfel, B. M., & Rudert, M. (2020). Does vitamin D deficiency predict tumour malignancy in patients with bone tumours? Data from a multi-center cohort analysis. *Journal of Bone Oncology*, 25(100329), 100329.
- Hu, K., Callen, D. F., Li, J., & Zheng, H. (2018). Circulating vitamin D and overall survival in breast cancer patients: A dose-response meta-analysis of cohort studies. *Integrative Cancer Therapies*, 17(2), 217–225.
- Ilmiawati, C., Oviana, A., Friadi, A., & Reza, M. (2020). Sunlight exposed body surface area is associated with serum 25-hydroxyvitamin D (25(OH)D) level in pregnant Minangkabau women, Indonesia. *BMC Nutrition*, 6(1), 18.
- Isakoff, M. S., Bielack, S. S., Meltzer, P., & Gorlick, R. (2015). Osteosarcoma: Current treatment and a collaborative pathway to success. *Journal of Clinical Oncology*, 33(27), 3029-3035.
- IQAir. (2025). 2024 World Air Quality Report. IQAir. <https://www.iqair.com/world-air-quality-report>
- Jaffe, N., Puri, A., & Gelderblom, H. (2002). Osteosarcoma metastasis. *Cancer Treatment and Research*, 152, 123-136.
- Jahromi, F., Al Mannai, M., Alabed, A., Alkhlofi, S., Hejres, S., Alromaihi, D., Kumar, P., & Freije, A. (2024). Impact of dust events on UV index and vitamin D synthesis in Bahrain and its correlation with population serum 25-hydroxyvitamin D levels. *Atmosphere*, 15(12), 1497.
- Janoušek, J., Pilařová, V., Macáková, K., Nomura, A., Veiga-Matos, J., Silva, D. D. da, Remião, F., Saso, L., Malá-Ládová, K., Malý, J., Nováková, L., & Mladěnka, P. (2022). Vitamin D: sources, physiological role, biokinetics, deficiency, therapeutic use, toxicity, and overview of analytical methods for detection of vitamin D and its metabolites. *Critical Reviews in Clinical Laboratory Sciences*, 59(8), 517–554.

- Jeon, S.-M., & Shin, E.-A. (2018). Exploring vitamin D metabolism and function in cancer. *Experimental & Molecular Medicine*, 50(4), 1–14.
- Jiang, Z., Pu, R., Li, N., Chen, C., Li, J., Dai, W., Wang, Y., Hu, J., Zhu, D., Yu, Q., Shi, Y., & Yang, G. (2023). High prevalence of vitamin D deficiency in Asia: A systematic review and meta-analysis. *Critical Reviews dalam Food Science and Nutrition*, 63(19), 3602–3611.
- Jovičić, S., Ignjatović, S., & Majkić-Singh, N. (2012). Biochemistry and metabolism of vitamin D / Biohemija i metabolizam vitamina D. *Journal of Medical Biochemistry*, 31(4), 309–315.
- Kallioğlu, M. A., Sharma, A., Kallioğlu, A., Kumar, S., Khargotra, R., & Singh, T. (2024). UV index-based model for predicting synthesis of (pre-)vitamin D3 in the mediterranean basin. *Scientific Reports*, 14(1), 1–15.
- Kamiya, S., Nakamori, Y., Takasawa, A., Takasawa, K., Kyuno, D., Ono, Y., Magara, K., & Osanai, M. (2023). Suppression of the vitamin D metabolizing enzyme CYP24A1 provides increased sensitivity to chemotherapeutic drugs in breast cancer. *Oncology Reports*, 49(5).
- Kaniki, F. R., Jonathan, R., & Mann, D. C. (2024). Quantitative analysis of the impact of seasonal cyclicity on serum 25-hydroxycholecalciferol concentration in Northwest Arctic. *International Journal of Nutrition Pharmacology Neurological Diseases*, 14(4), 416–424.
- Kapala, A., Szlendak, M., & Grochowska, E. (2021). Cross-sectional observational study - Investigation of vitamin D concentration in Caucasian cancer patients. what is the adequate dose of vitamin D for these patients? *Clinical Nutrition (Edinburgh, Scotland)*, 40(6), 3852–3858.
- Kekalih, A., Chandra, D. N., Mirtha, L. T., Khouw, I., Wong, G., Sekartini, R., & SEANUTS II Indonesia Study Group. (2025). Dietary intakes, nutritional and biochemical status of 6 months to 12-year-old children before the COVID-19 pandemic era: the South East Asian Nutrition Survey II Indonesia (SEANUTS II) study in Java and Sumatera Islands, Indonesia. *Public Health Nutrition*, 28(1), e1.
- Kelishadi, R., Sharifi-Ghazvini, F., Poursafa, P., Mehrabian, F., Farajian, S., Yousefy, H., Movahedian, M., & Sharifi-Ghazvini, S. (2013). Determinants of hypovitaminosis d in pregnant women and their newborns in a sunny region. *International Journal of Endocrinology*, 2013, 460970.

- Khalid, A. T., Moore, C. G., Hall, C., Olabopo, F., Rozario, N. L., Holick, M. F., Greenspan, S. L., & Rajakumar, K. (2017). Utility of sun-reactive skin typing and melanin index for discerning vitamin D deficiency. *Pediatric Research*, 82(3), 444–451.
- Kim, K. J., Kim, Y. J., Kim, S. H., An, J. H., Yoo, H. J., Kim, H. Y., Seo, J. A., Kim, S. G., Kim, N. H., Choi, K. M., Baik, S. H., Choi, D. S., & Kim, N. H. (2015). Vitamin D status and associated metabolic risk factors among North Korean refugees in South Korea: a cross-sectional study. *BMJ Open*, 5(11), e009140.
- Kim, J.-M., Lin, C., Stavre, Z., Greenblatt, M. B., & Shim, J.-H. (2020). Osteoblast-osteoclast communication and bone homeostasis. *Cells (Basel, Switzerland)*, 9(9), 2073.
- Klinedinst, B. S., Meier, N. F., Larsen, B., Wang, Y., Yu, S., Mochel, J. P., Le, S., Wolf, T., Pollpeter, A., Pappas, C., Wang, Q., Allenspach, K., Wang, L., Russell, D., Bennett, D. A., & Willette, A. A. (2020). Walking in the light: How history of physical activity, sunlight, and vitamin D account for body fat-A UK biobank study. *Obesity (Silver Spring, Md.)*, 28(8), 1428–1437.
- Kurucu, N., Şahin, G., Sarı, N., Ceylaner, S., & İlhan, İ. E. (2019). Association of vitamin D receptor gene polymorphisms with osteosarcoma risk and prognosis. *Journal of Bone Oncology*, 14(100208), 100208.
- Kuznia, S., Czock, D., Kopp-Schneider, A., Caspari, R., Fischer, H., Laetsch, D. C., Slavic, M., Brenner, H., & Schöttker, B. (2022). Efficacy and safety of a personalized vitamin D3 loading dose followed by daily 2000 IU in colorectal cancer patients with vitamin D insufficiency: Interim analysis of a randomized controlled trial. *Nutrients*, 14(21), 4546.
- Kvammen, J. A., Stensvold, E., Godang, K., Bollerslev, J., Myklebust, T. Å., Brandal, P., Henriksen, C., & Bechensteen, A. G. (2022). Bone mineral density and nutrition in long-term survivors of childhood brain tumors. *Clinical Nutrition ESPEN*, 50, 162–169.
- Lee, M.-J., Hsu, H.-J., Wu, I.-W., Sun, C.-Y., Ting, M.-K., & Lee, C.-C. (2019). Vitamin D deficiency in northern Taiwan: a community-based cohort study. *BMC Public Health*, 19(1).

- Lingerih, T., Yeshiwas, S., Mohamedsaid, A., & Arega, G. (2024). Patterns and treatment outcomes of primary bone tumors in children treated at tertiary referral hospital, Ethiopia. *BMC Cancer*, 24(1), 394.
- Li Z., Shi J., Wang Z., Chen H., & Liu Y. (2021). Nutrient status of vitamin D among cancer patients. *Zhongguo fei ai za zhi [Chinese journal of lung cancer]*, 24(5), 345–350.
- Liu, D. S., Snyder, B. D., & Mahan, S. T. (2024). Fracture nonunion and delayed union. *Journal of the Pediatric Orthopaedic Society of North America*, 7(100058), 100058.
- Lu, S., & Cao, Z.-B. (2023). Interplay between vitamin D and adipose tissue: Implications for adipogenesis and adipose tissue function. *Nutrients*, 15(22), 4832.
- Lwanga, S. K & Lemeshow S. 1991. *Sample Size Determination in Health Studies: A Practical Manual*. Inggris: WHO.
- Mahan, S., Ackerman, K., DiFazio, R., Miller, P., Feldman, L., Sullivan, N., Glotzbecker, M., & Holm, I. A. (2021). Retrospective study of patterns of vitamin D testing and status at a single institution paediatric orthopaedics and sports clinics. *BMJ Open*, 11(12), e047546.
- Maier, G. S., Weissenberger, M., Rudert, M., Roth, K. E., & Horas, K. (2021). The role of vitamin D and vitamin D deficiency in orthopaedics and traumatology—a narrative overview of the literature. *Annals of Translational Medicine*, 9(11), 942–942.
- Marco Continente, C., Luesma Bartolomé, M. J., & Santander Ballestín, S. (2021). Influencia de la actividad física en la prevención, tratamiento antineoplásico y supervivencia de pacientes con cáncer de mama. *Revista de senología y patología mamaria*, 34(4), 220–235.
- Margiono, E. A., & Andreani, S. (2023). Case report of a very rare primary malignant bone tumor: Mixed type maxillary osteosarcoma. *Radiology Case Reports*, 18(5), 1680–1685.
- Martin-Herranz, A., & Salinas-Hernández, P. (2015). Vitamin D supplementation review and recommendations for women diagnosed with breast or ovary cancer in the context of bone health and cancer prognosis/risk. *Critical Reviews in Oncology/Hematology*, 96(1), 91–99.

- Marsyaelina, Arifin, Z., Sutiman, S., Solikin, M., & Iskandar, R. (2020). Analysis of exhaust gas emission from gasoline- and diesel-powered vehicles in sleman regency, Indonesia 2019. *American Journal of Mechanical Engineering*, 7(4), 195–200.
- Meazza, C., & Scanagatta, P. (2016). Metastatic osteosarcoma: a challenging multidisciplinary treatment. *Expert Review of Anticancer Therapy*, 16(5), 543–556.
- Mendes, M. M., Botelho, P. B., & Ribeiro, H. (2022). Vitamin D and musculoskeletal health: outstanding aspects to be considered in the light of current evidence. *Endocrine Connections*, 11(10).
- Menendez, N., Epelman, M., Shao, L., Douglas, D., & Meyers, A. B. (2022). Pediatric osteosarcoma: Pearls and pitfalls. *Seminars in Ultrasound, CT, and MR*, 43(1), 97–114.
- Misiąg, Weronika, Anna Piszczyk, Anna Szymańska-Chabowska, Mariusz Chabowski. (2022). Physical Activity and Cancer Care—A Review. *Cancer*, 14, 4154.
- Moan, J., Bruland, Ø. S., Dahlback, A., Juzeniene, A., & Porojnicu, A. C. (2010). Vitamin D status, solar radiation and cancer prognosis. In *Vitamin D* (pp. 765–775). Humana Press.
- Murni, I. K., Sulistyoningrum, D. C., Gasevic, D., Susilowati, R., & Julia, M. (2021). Sex differences in the association of vitamin D and metabolic risk factors with carotid intima-media thickness in obese adolescents. *PloS One*, 16(10), e0258617.
- Mustafa, A., & Shekhar, C. (2021). Concentration levels of serum 25-Hydroxyvitamin-D and vitamin D deficiency among children and adolescents of India: a descriptive cross-sectional study. *BMC Pediatrics*, 21(1), 334.
- Naganuma, J., Koyama, S., Arisaka, O., & Yoshihara, S. (2022). Low serum 25-hydroxyvitamin D level is associated with obesity and atherogenesis in adolescent boys. *Annals of Pediatric Endocrinology & Metabolism*, 27(1), 30–36.
- Nindrea, R. D., & Hendriyani, H. (2024). Prevalence of vitamin D deficiency among pregnant women in Southeast Asia represents public health crisis: A

- systematic review and meta-analysis. *Clinical Epidemiology and Global Health*, 27(101574), 101574.
- Ning, Z., Song, S., Miao, L., Zhang, P., Wang, X., Liu, J., Hu, Y., Xu, Y., Zhao, T., Liang, Y., Wang, Q., Liu, L., Zhang, J., Hu, L., Huo, M., & Zhou, Q. (2016). High prevalence of vitamin D deficiency in urban health checkup population. *Clinical Nutrition (Edinburgh, Scotland)*, 35(4), 859–863.
- Nimitphong, H., & Holick, M. F. (2013). Vitamin D status and sun exposure in southeast Asia. *Dermato-Endocrinology*, 5(1), 34–37.
- Norahmawati, E., Rahmadiani, N., Endharti, A. T., & Isma, S. P. P. (2024). Clinicopathological Characteristics of Osteosarcoma Cases in A Tertiary Referral Hospital in Indonesia: A 5-year Retrospective Study. *GSC Advanced Research and Reviews*, 18(02), 009–016.
- Nugraha, Prapanca. (2022). Korelasi Kadar Vitamin D dengan Diagnosis Kanker Kolorektal di RSUP Dr. Hasan Sadikin Bandung. Tesis. Universitas Padjadjaran.
- Octavius, G. S., Shakila, A., Meliani, M., & Halim, A. (2023). Vitamin D deficiency is a public health emergency among Indonesian children and adolescents: a systematic review and meta-analysis of prevalence. *Annals of Pediatric Endocrinology & Metabolism*, 28(1), 10–19.
- Oktaria, V., Graham, S. M., Triasih, R., Soenarto, Y., Bines, J. E., Ponsonby, A.-L., Clarke, M. W., Dinari, R., Nirwati, H., & Danchin, M. (2020). The prevalence and determinants of vitamin D deficiency in Indonesian infants at birth and six months of age. *PloS One*, 15(10), e0239603.
- Oktaria, V., Putri, D. A. D., Ihyauddin, Z., Julia, M., Sulistyoningrum, D. C., Koon, P. B., Danchin, M., & Murni, I. K. (2022). Vitamin D deficiency in South-East Asian children: a systematic review. *Archives of Disease in Childhood*, 107(11), 980–987.
- Park, C. Y., & Han, S. N. (2024). Vitamin D and obesity. *Advances in Food and Nutrition Research*, 109, 221–247.
- Park, H. Y., Lim, Y.-H., Park, J. B., Rhie, J., & Lee, S.-J. (2020). Environmental and occupation factors associated with vitamin D deficiency in Korean adults: The Korea National Health and Nutrition Examination Survey (KNHANES) 2010–2014. *International Journal of Environmental Research and Public Health*, 17(24), 9166.

- Pandey, A., Singh, A., & Singh, S. (2020). Prevalence of Vitamin D deficiency in treatment-naive individual consecutive cancer patients. *Cancer Research, Statistics, and Treatment*, 3(1), 25.
- Petrou, S., Mamais, I., Lavranos, G., P Tzanetakou, I., & Chrysostomou, S. (2018). Effect of vitamin D supplementation in prostate cancer: A systematic review of randomized control trials. *International Journal for Vitamin and Nutrition Research*, 88(1–2), 100–112.
- Pilavaki, P., Gahanbani Ardakani, A., Gikas, P., & Constantinidou, A. (2023). Osteosarcoma: Current concepts and evolutions in management principles. *Journal of Clinical Medicine*, 12(8), 2785.
- Phimphilai, M., Watthanawongkeeree, S., & Manosroi, W. (2025). Exposure to seasonal PM2.5 derived from biomass burning increased the risk of vitamin D deficiency in healthy perimenopausal women. *International Archives of Occupational and Environmental Health*.
- Poitout, D. G. (2021). Osteosarcoma. In *Bone Tumors* (pp. 35–43). Springer London.
- Pratiwi, Astrid Siska & Yahwardiah Siregar. (2018). Hubungan Kadar Vitamin D Plasma dengan Indeks Mitosis pada Pasien Kanker Payudara. *Sriwijaya Journal of Medicine*, 1(3), 143-149.
- Pulungan, A., Soesanti, F., Tridjaja, B., & Batubara, J. (2021). Vitamin D insufficiency and its contributing factors in primary school-aged children in Indonesia, a sun-rich country. *Annals of Pediatric Endocrinology & Metabolism*, 26(2), 92–98.
- Purnomo, Muhammad R. A. & Adhe R. Anugerah. (2020). Achieving Sustainable Environment Through Prediction of Air Pollutants in Yoogyakartat Using Adaptive Neuro Fuzzy Inference System. *Journal of Engineering Science and Technology*, 15(5), 2995 - 3012.
- Puspitaningtyas, H., Sulistyoningrum, D. C., Witaningrum, R., Widodo, I., Hardianti, M. S., Taroen-Hariadi, K. W., Kurnianda, J., Purwanto, I., & Hutajulu, S. H. (2022). Vitamin D status in breast cancer cases following chemotherapy: A pre and post observational study in a tertiary hospital in Yogyakarta, Indonesia. *PloS One*, 17(6), e0270507.

- Rathore, R., & Van Tine, B. A. (2021). Pathogenesis and current treatment of osteosarcoma: Perspectives for future therapies. *Journal of Clinical Medicine*, 10(6), 1182.
- Raymond-Lezman, J. R., & Riskin, S. I. (2023). Benefits and risks of sun exposure to maintain adequate vitamin D levels. *Cureus*, 15(5), e38578.
- Razi, Khalikul. (2023). Pengaruh suplementasi vitamin D terhadap kadar CEA pada keganasan kolorektal stadium I-III. Tesis. Universitas Indonesia.
- Reboul, E., Goncalves, A., Comera, C., Bott, R., Nowicki, M., Landrier, J.-F., Jourdheuil-Rahmani, D., Dufour, C., Collet, X., & Borel, P. (2011). Vitamin D intestinal absorption is not a simple passive diffusion: Evidences for involvement of cholesterol transporters. *Molecular Nutrition & Food Research*, 55(5), 691–702.
- Richter, K., Breitner, S., Webb, A. R., Huth, C., Thorand, B., Kift, R., Linseisen, J., Schuh, A., Kratzsch, J., Mielck, A., Weidinger, S., Peters, A., Schneider, A., & KORA Study Group. (2014). Influence of external, intrinsic and individual behaviour variables on serum 25(OH)D in a German survey. *Journal of Photochemistry and Photobiology. B, Biology*, 140, 120–129.
- Radivojevic, N., Grujicic, S. S., Suljagic, V., Stojkovic, S., Arsovic, K., Jakovljevic, S., Bukurov, B., & Arsovic, N. (2025). Prognostic value of serum 25-hydroxyvitamin D levels and malnutrition status on postoperative complications in patients following laryngectomy with neck dissection. *European Archives of Oto-Rhino-Laryngology: Official Journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS): Affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery*, 282(1), 341–349.
- Respati, R. A., Yusharyahya, S. N., Wibawa, L. P., & Widaty, S. (2022). The dermoscopic features of photoaging and its association with sun index score in the coastal population at Cilincing, Jakarta: A cross-sectional study. *Clinical, Cosmetic and Investigational Dermatology*, 15, 939–946.
- Rochel N. (2022). Vitamin D and Its Receptor from a Structural Perspective. *Nutrients*, 14(14), 2847.
- Rojanaworarit, C. (2020). Misleading epidemiological and statistical evidence in the presence of Simpson's paradox: An illustrative study using simulated

- scenarios of observational study designs. *Journal of Medicine and Life*, 13(1), 37–44.
- Romano, A., Triarico, S., Rinninella, E., Natale, L., Brizi, M. G., Cintoni, M., Raoul, P., Maurizi, P., Attinà, G., Mastrangelo, S., Gasbarrini, A., Mele, M. C., & Ruggiero, A. (2022). Clinical impact of nutritional status and sarcopenia in pediatric patients with bone and soft tissue sarcomas: A pilot retrospective study (SarcoPed). *Nutrients*, 14(2), 383.
- Roren, R. S., Mario Christopher, P., & Novia Jayadi, N. (2022). Photoprotection knowledge and photoprotective behavior of university students: A cross-sectional study in Indonesia. *International Journal of Dermatology and Venereology*, 5(3), 140–148.
- Rout, P., & Jialal, I. (2025). Hyperphosphatemia. *In StatPearls*. StatPearls Publishing.
- Rothzerg, E., Xu, J., & Wood, D. (2023). Different subtypes of osteosarcoma: Histopathological patterns and clinical behaviour. *Journal of Molecular Pathology*, 4(2), 99–108.
- Saraff, V., & Shaw, N. (2016). Sunshine and vitamin D. *Archives of Disease in Childhood*, 101(2), 190–192.
- Sachdeva S. (2009) Fitzpatrick skin typing: Applications in dermatology. *Indian J Dermatol Venereol Leprol*, 75, 93-6.
- Sari, D. K., Damanik, H. A., Lipoeto, N. I., & Lubis, Z. (2013). Low serum 25(OH)D levels are associated with single nucleotide polymorphisms of the vitamin D receptor gene and lifestyle factors, especially in women with higher body fat percentage. *Obesity Research & Clinical Practice*, 7, 12–13.
- Sarı, E., Çoban, G., Öztekin Çelebi, F. Z., & Altinel Açoğlu, E. (2021). The status of vitamin D among children aged 0 to 18 years. *The Journal of Pediatric Research*, 8(4), 438–443.
- Syafei, Zakirullah, Sri Suryani W., & Denny Rifsal S. (2018). Hubungan Kadar Vitamin D Plasma dengan IMT dan Umur pada Kanker Payudara. *Jurnal AcTion: Aceh Nutrition Journal*, 2 (3), 117-123.
- Seraphin, G., Rieger, S., Hewison, M., Capobianco, E., & Lisse, T. S. (2023). The Impact of Vitamin D on Cancer: A mini Review. *The Journal of Steroid Biochemistry and Molecular Biology*, 231(106308), 106308.

- Silva, M. C., & Furlanetto, T. W. (2018). Intestinal absorption of vitamin D: a systematic review. *Nutrition Reviews*, 76(1), 60–76.
- Singh Ospina, N., Diaz-Thomas, A., McDonnell, M. E., Demay, M. B., Pittas, A. G., York, E., Corrigan, M. D., Lash, R. W., Brito, J. P., Murad, M. H., & McCartney, C. R. (2024). Navigating complexities: Vitamin D, skin pigmentation, and race. *The Journal of Clinical Endocrinology and Metabolism*, 109(8), 1955–1960.
- Sizar, O., Khare, S., Goyal, A., & Givler, A. (2025). Vitamin D deficiency. In StatPearls. StatPearls Publishing.
- Shahid, S., & Chaudary, M. A. (2022). Association of 25-hydroxyvitamin D with hematological profile and anthropometry in patients with glioma. *Revista Da Associacao Medica Brasileira*, 68(11), 1547–1552.
- Shaurova, T., Calkins, H., Seshadri, M., Johnson, C. S., & Hershberger, P. A. (2024). Vitamin D in the management of lung cancer. In *Feldman and Pike's Vitamin D* (pp. 901–915). Elsevier.
- Skender, S., Böhm, J., Schrotz-King, P., Chang-Claude, J., Siegel, E. M., Steindorf, K., Owen, R. W., Ose, J., Hoffmeister, M., Brenner, H., & Ulrich, C. M. (2017). Plasma 25-hydroxyvitamin D3 levels in colorectal cancer patients and associations with physical activity. *Nutrition and Cancer*, 69(2), 229–237.
- Smeland, S., Bielack, S. S., Whelan, J., Bernstein, M., Hogendoorn, P., Krailo, M. D., Gorlick, R., Janeway, K. A., Ingleby, F. C., Anninga, J., Antal, I., Arndt, C., Brown, K. L. B., Butterfass-Bahloul, T., Calaminus, G., Capra, M., Dhooze, C., Eriksson, M., Flanagan, A. M., ... Marina, N. (2019). Survival and prognosis with osteosarcoma: outcomes in more than 2000 patients in the EURAMOS-1 (European and American Osteosarcoma Study) cohort. *European Journal of Cancer (Oxford, England: 1990)*, 109, 36–50.
- Song, C., Sun, H., Wang, B., Song, C., & Lu, H. (2021). Association between vitamin D status and undernutrition indices in children: A systematic review and meta-analysis of observational studies. *Frontiers in Pediatrics*, 9, 665749.
- Sowah, D., Fan, X., Dennett, L., Hagtvedt, R., & Straube, S. (2017). Vitamin D levels and deficiency with different occupations: a systematic review. *BMC Public Health*, 17(1).

- Stival, C., Lugo, A., Odone, A., van den Brandt, P. A., Fernandez, E., Tigova, O., Soriano, J. B., José López, M., Scaglioni, S., Gallus, S., & TackSHS Project Investigators. (2022). Prevalence and correlates of overweight and obesity in 12 European countries in 2017-2018. *Obesity Facts*, 15(5), 655–665.
- Stokes, V. J., Nielsen, M. F., Hannan, F. M., & Thakker, R. V. (2017). Hypercalcemic disorders in children. *Journal of Bone and Mineral Research: The Official Journal of the American Society for Bone and Mineral Research*, 32(11), 2157–2170.
- Streb, J., Glanowska, I., Streb, A., Szpor, J., Kryka, K., Potocki, P., Wójcik, M., & Jach, R. (2017). The relationship between breast cancer treatment, tumour type and vitamin D level in pre- and postmenopausal women. *Neuro Endocrinology Letters*, 38(6), 437–440.
- Su, Y.-W., Lee, A. M. C., Xu, X., Hua, B., Tapp, H., Wen, X.-S., & Xian, C. J. (2023). Methotrexate chemotherapy causes growth impairments, vitamin D deficiency, bone loss, and altered intestinal metabolism-effects of calcitriol supplementation. *Cancers*, 15(17), 4367.
- Teixeira, L. A. C., Soares, L. A., Parentoni, A. N., Nobre, J. N. P., Figueiredo, P. H. S., Leopoldino, A. A. O., Avelar, N. C. P., Mendonça, V. A., & Lacerda, A. C. R. (2024). Inflammatory biomarkers of osteosarcopenia in community-dwelling older woman. *Clinical Nutrition Open Science*, 55, 173–182.
- Tirgar, A., Rezaei, M., Ehsani, M., Salmani, Z., Rastegari, A., Jafari, E., Khandani, B. K., Nakhaee, N., Khaksari, M., & Moazed, V. (2024). Exploring the synergistic effects of vitamin D and synbiotics on cytokines profile, and treatment response in breast cancer: a pilot randomized clinical trial. *Scientific Reports*, 14(1), 21372.
- Thompson, L., Wang, S., Tawfik, O., Templeton, K., Tancabelic, J., Pinson, D., Anderson, H. C., Keighley, J., & Garimella, R. (2012). Effect of 25-hydroxyvitamin D3 and 1  $\alpha$ ,25 dihydroxyvitamin D3 on differentiation and apoptosis of human osteosarcoma cell lines. *Journal of Orthopaedic Research: Official Publication of the Orthopaedic Research Society*, 30(5), 831–844.

- Tuna, S., Aydin, M. A., & Aydin, M. F. (2023). The four horsemen of the apocalypse: Cancer, depression, vitamin D deficiency, and obesity: An observational study. *Disease Markers*, 2023, 9652491
- Turer, C. B., Lin, H., & Flores, G. (2013). Prevalence of vitamin D deficiency among overweight and obese US children. *Pediatrics*, 131(1), e152-61.
- Tsugawa, N., Uenishi, K., Ishida, H., Ozaki, R., Takase, T., Minekami, T., Uchino, Y., Kamao, M., & Okano, T. (2016). Association between vitamin D status and serum parathyroid hormone concentration and calcaneal stiffness in Japanese adolescents: sex differences in susceptibility to vitamin D deficiency. *Journal of Bone and Mineral Metabolism*, 34(4), 464–474.
- van den Heuvel, E. G. H. M., van Schoor, N., de Jongh, R. T., Visser, M., & Lips, P. (2013). Cross-sectional study on different characteristics of physical activity as determinants of vitamin D status; inadequate in half of the population. *European Journal of Clinical Nutrition*, 67(4), 360–365.
- Vashi, P. G., Lammersfeld, C. A., Braun, D. P., & Gupta, D. (2011). Serum 25-hydroxyvitamin D is inversely associated with body mass index in cancer. *Nutrition Journal*, 10, 51.
- Vucak, J., Matijevic, J., Pivac, I., & Markic, J. (2023). Adherence to vitamin D supplementation during infancy-A single pediatric primary practice retrospective study. *Pediatric Reports*, 15(4), 660–667.
- Wang, N., Li, M., Huang, L., Zou, Z., Deng, Y., Liu, Y., Chen, R., Liu, Y., Yu, J., Yang, T., Hua, H., Yang, D., Ma, F., & Li, X. (2020). The relationship between PM2.5 and the action spectrum of ultraviolet radiation for vitamin D production based on a manikin model. *IEEE Access: Practical Innovations, Open Solutions*, 8, 28718–28734.
- Wamberg, L., Kampmann, U., Stødkilde-Jørgensen, H., Rejnmark, L., Pedersen, S. B., & Richelsen, B. (2013). Effects of vitamin D supplementation on body fat accumulation, inflammation, and metabolic risk factors in obese adults with low vitamin D levels - results from a randomized trial. *European Journal of Internal Medicine*, 24(7), 644–649.
- Webb, A. R., Kazantzidis, A., Kift, R. C., Farrar, M. D., Wilkinson, J., & Rhodes, L. E. (2018). Colour counts: Sunlight and skin type as drivers of vitamin D deficiency at UK latitudes. *Nutrients*, 10(4).

- Webb, A. R., Alghamdi, R., Kift, R., & Rhodes, L. E. (2021). 100 YEARS OF VITAMIN D: Dose-response for change in 25-hydroxyvitamin D after UV exposure: outcome of a systematic review. *Endocrine Connections*, 10(10), R248–R266.
- Widyastuti, T. N., Turner, R., Harcombe, H., & McLean, R. (2023). Trends in BMI of Indonesian adults between 1993 and 2014: a longitudinal population-based study. *Public Health Nutrition*, 26(7), 1394–1402.
- Wierzbicka, A., & Oczkiewicz, M. (2022). Sex differences in vitamin D metabolism, serum levels and action. *The British Journal of Nutrition*, 128(11), 2115–2130.
- Whiting, S. J., Bonjour, J.-P., Payen, F. D., & Rousseau, B. (2015). Moderate amounts of vitamin D3 in supplements are effective in raising serum 25-hydroxyvitamin D from low baseline levels in adults: a systematic review. *Nutrients*, 7(4), 2311–2323.
- WHO. 2002. *Global Solar UV Index: A Practical Guide*. Geneva: World Health Organization.
- WHO. 2021. *WHO Global Air Quality Guidelines: Particulate Matter (PM<sub>2.5</sub> & PM<sub>10</sub>), Ozone, Nitrogen Dioxide and Carbon Monoxide*. Geneva: World Health Organization.
- Wolpowitz, D., & Gilchrest, B. A. (2006). The vitamin D questions: How much do you need and how should you get it? *Journal of the American Academy of Dermatology*, 54(2), 301–317.
- Wortsman, J., Matsuoka, L. Y., Chen, T. C., Lu, Z., & Holick, M. F. (2000). Decreased bioavailability of vitamin D in obesity. *The American Journal of Clinical Nutrition*, 72(3), 690–693.
- Wu, H., Li, S., Lin, Y., Wang, J., Chekhonin, V. P., Peltzer, K., Baklaushev, V. P., Abbas, K. S., Zhang, J., Li, H., & Zhang, C. (2022). Association between malnutrition and leucopenia in patients with osteosarcoma. *Frontiers in Nutrition*, 9, 899501.
- Xiang, F., Lucas, R., de Gruijl, F., & Norval, M. (2015). A systematic review of the influence of skin pigmentation on changes in the concentrations of vitamin D and 25-hydroxyvitamin D in plasma/serum following experimental UV irradiation. *Photochemical & Photobiological Sciences: Official Journal of*

- the European Photochemistry Association and the European Society for Photobiology*, 14(12), 2138–2146.
- Xu, J., Li, W., Ma, J., Liu, J., Sha, H., Zhou, S., Wang, F., & Ma, Q. (2013). Vitamin D - pivotal nutraceutical in the regulation of cancer metastasis and angiogenesis. *Current Medicinal Chemistry*, 20(33), 4109–4120.
- Yadwad, A. R., Iyer, J. R., Korikani, M., Bhavanam, K. R., & Kancha, R. K. (2024). Bone cancer. In *Biomedical Aspects of Solid Cancers* (pp. 253–264). Springer Nature Singapore.
- Yang, Chaofei, Tian, Y., Zhao, F., Chen, Z., Su, P., Li, Y., & Qian, A. (2020). Bone microenvironment and osteosarcoma metastasis. *International Journal of Molecular Sciences*, 21(19), 6985.
- Yang, C., Li, D., Tian, Y., & Wang, P. (2021). Ambient air pollutions are associated with vitamin D status. *International Journal of Environmental Research and Public Health*, 18(13), 6887.
- Yang, L., & Toriola, A. T. (2017). Inflammation modifies the association of obesity with circulating 25-hydroxyvitamin D levels in cancer survivors. *Obesity* (Silver Spring, Md.), 25 Suppl 2, S58–S65.
- Yenny, S. W. (2020). Clinico-epidemiological features of Melasma: A retrospective study from dermatology-venereology department of education center hospital in west Sumatera, Indonesia. *International Journal of Pharmtech Research*, 13(4), 388–392.
- Yeşiltepe-Mutlu, G., Aksu, E. D., Bereket, A., & Hatun, Ş. (2020). Vitamin D status across age groups in Turkey: Results of 108,742 samples from a single laboratory. *Journal of Clinical Research in Pediatric Endocrinology*, 12(3), 248–255.
- Yunara, Sarah, Novira Widajanti, & Jusri Ichwani. (2020). Association of 25-hydroxyvitamin D concentration and frailty degree in elderly community in Surabaya. *International Journal of Pharmaceutical Research*, 12(04).
- Zaremba, S. M. M., & Conduit-Turner, K. (2024). Knowledge of vitamin D and practices of vitamin D supplementation in a Scottish adult population: A cross-sectional study. *Nutrition and Health*, 2601060241238824.
- Zębalski, M. A., Zębalska, P., Krzywón, A., & Nowosielski, K. (2025). Vitamin D concentration among women with gynecological cancers. *Cancers*, 17(12).

- Zhang, S., Miller, D. D., & Li, W. (2021). Non-musculoskeletal benefits of vitamin D beyond the musculoskeletal system. *International Journal of Molecular Sciences*, 22(4), 2128.
- Zhang, H., Zhu, A., Liu, L., Zeng, Y., Liu, R., Ma, Z., Liu, M., Bi, J., & Ji, J. S. (2022). Assessing the effects of ultraviolet radiation, residential greenness and air pollution on vitamin D levels: A longitudinal cohort study in China. *Environment International*, 169(107523), 107523.
- Zhang, Y., Shen, Z., Pei, H., Wang, G., Wang, Z., Wei, X., Yu, J., Wang, C., Hua, J., & He, B. (2024). Impact of particulate-matter air pollution on 25-hydroxyvitamin D levels: a mendelian randomisation study. *Public Health*, 230, 190–197.
- Zhang, Yu, Xu, Y., Zhong, W., Zhao, J., Liu, X., Gao, X., Chen, M., & Wang, M. (2025). Vitamin D and immune checkpoint inhibitors in lung cancer: A synergistic approach to enhancing treatment efficacy. *International Journal of Molecular Sciences*, 26(10).
- Zhuang, Y., Zhu, Z., Chi, P., Zhou, H., Peng, Z., Cheng, H., Xin, X., Luo, W., Si, S., Mo, M., Chen, D., Liu, H., & Yu, Y. (2023). Efficacy of intermittent versus daily vitamin D supplementation on improving circulating 25(OH)D concentration: a Bayesian network meta-analysis of randomized controlled trials. *Frontiers in Nutrition*, 10, 1168115.
- Zimmerman, L., & McKeon, B. (2023). *Osteomalacia*. Treasure Island (FL): StatPearls Publishing.