

**PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI
TUBUH, SIKLUS MENSTRUASI DAN DISMENORE PADA WANITA
OBESITAS**

**Diajukan untuk memenuhi sebagian dari syarat memperoleh gelar
Magister Pendidikan Program Studi Olahraga**

TESIS



Oleh :
Linda Desrianda Tamher
1802515

**PROGRAM STUDI REGULER KEPELATIHAN OLAHRAGA
JURUSAN PENDIDIKAN OLAHRAGA
SEKOLAH PASCASARJANA
UNIVERSITAS PENDIDIKAN INDONESIA
2020**

**PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI
TUBUH, SIKLUS MENSTRUASI DAN DISMENORE PADA WANITA
OBESITAS**

Oleh
Linda Desrianda Tamher

Sebuah Tesis Yang Disusun Untuk Memenuhi Salah Satu Syarat
Memperoleh Gelar Magister Pendidikan
Program Studi Pendidikan Olahraga Reguler Kepelatihan

©Linda Desrianda Tamher 2020
Universitas Pendidikan Indonesia
Agustus 2020

Hak Cipta dilindungi undang-undang.
Tesis ini tidak boleh diperbanyak seluruhnya atau sebagian,
Dengan dicetak ulang, difoto kopi, atau cara lainnya tanpa ijin dari penulis.

PERNYATAAN

Dengan ini saya menyatakan bahwa tesis dengan judul “*Pengaruh Senam Aerobik Dan Zumba Terhadap Komposisi Tubuh, Siklus Menstruasi Dan Dismenore Pada Wanita*” ini beserta seluruh isinya adalah benar-benar karya saya

sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, Agustus 2020
Yang membuat pernyataan,

Linda Desrianda Tamher

NIM: 1802515

LEMBAR PENGESAHAN
LINDA DESRIANDA TAMHER

PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI
TUBUH, SIKLUS MENSTRUASI DAN DISMENORE PADA WANITA
OBESITAS

Disetujui dan Disahkan Oleh :
Pembimbing I



Mustika Fitri, M.Pd., Ph.D

NIP : 196812201998022001

Pembimbing II



dr. Pipit Pitriani, M.Kes., Ph.D

NIP : 197908262010122003

Mengetahui,
Ketua Program Studi
Pendidikan Olahraga SPS UPI



Prof. Dr. H. Amung Ma'mun M.Pd

NIP. 196001191986031002

ABSTRAK

**PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI
TUBUH, SIKLUS MENSTRUASI DAN DISMENORE PADA WANITA
OBESITAS**

**Linda Desrianda Tamher
1802515**

**Sekolah Pascasarjana
Universitas Pendidikan Indonesia**

**Mustika Fitri, M.Pd P.hD
dr. Pipit Pitriani, M.Kes P.hD**

Obesitas adalah salah satu penyakit serius yang meningkat setiap tahunnya, dan lebih banyak menyerang wanita usia reproduktif. Tujuan penelitian ini untuk mengetahui pengaruh dan perbandingan pengaruh senam aerobik dan zumba terhadap komposisi tubuh, siklus menstruasi dan dismenore. Penelitian eksperimen ini dilakukan dengan teknik pengambilan sampel *purposive sampling* pada member S Fitness Center, sehingga didapatkan sampel yang memenuhi kriteria dan dibagi menjadi 2 kelompok secara acak, 11 orang kelompok senam aerobik dan 11 orang kelompok zumba. Instrumen yang digunakan adalah pengukuran komposisi tubuh menggunakan alat *Omron Karada Scale*, angket menstruasi dan angket dismenore, hasil data yang dihitung dengan rumus *Paired Sample T-Test* dan *One Way Anova SPSS*. Hasil penelitian berpengaruh signifikan untuk komposisi tubuh dan dismenore, dan hasil penelitian tidak berpengaruh signifikan untuk siklus menstruasi dan perbandingan pengaruh kedua kelompok. Dapat disimpulkan senam aerobik dan zumba berpengaruh terhadap komposisi tubuh dan dismenore, akan tetapi tidak berpengaruh terhadap siklus menstruasi, lalu senam aerobik dan zumba memiliki pengaruh yang sama terhadap penurunan komposisi tubuh, siklus menstruasi dan dismenore.

Kata kunci : Senam Aerobik, Zumba, Komposisi Tubuh, Siklus Menstruasi, Dismenore, Wanita Obesitas

ABSTRACT

EFFECT OF AEROBIC DANCE AND ZUMBA ON BODY COMPOSITION, MENSTRUAL CYCLE, AND DYSMENORRHAE FOR OBESE WOMEN

**Linda Desrianda Tamher
1802515**

**School Of Postgraduate
Universitas Pendidikan Indonesia**

**Mustika Fitri, M.Pd P.hD
dr. Pipit Pitriani, M.Kes P.hD**

Obesity is the one serious disease which increased every years, and more suffered to reproductive age women. The aim of this research is to examine the effect and the comparation effect aerobic dance and zumba for body composition, menstrual cycle and dysmenorrhea. This experiment research used purposive sampling to S Fitness Center members, until obtained samples had an criterias and that's devided random to 2 group, 11 peoples to aerobic dance's group and 11 peoples to zumba's group. The instruments is Omron Karada Scale for measuring body composition, menstruation quissionaire and dysmenorrhea quissionaire, the data used Paired Sample T-Test and One Way Anova SPSS for get the result. The result had significant difference for body composition and dysmenorrhea, and the result h for menstrual cycle and the comparation effect of 2 groups. The conclusion is aerobic dance and zumba have a significant effect for body composition and dysmenorrhea, but have not significant effect for menstrual cycle, also aerobic dance and zumba have a same effect for decreasing body composition, menstrual cycle and dysmenorrhea.

Kata kunci : Aerobic Dance, Zumba, Body Composition, Menstrual Cycle, Dysmenorrhoe, Obese Women

DAFTAR ISI

PERNYATAAN	i
ABSTRAK	ii
KATA PENGANTAR	iv
UCAPAN TERIMA KASIH	v
DAFTAR ISI	vii
DAFTAR TABEL	ix
DAFTAR GAMBAR	ix
DAFTAR GRAFIK	x
DAFTAR LAMPIRAN	x
BAB I PENDAHULUAN	1
1.1 Latar Belakang Penelitian	1
1.2 Rumusan Masalah Penelitian	5
1.3 Tujuan Peneltian	5
1.4 Manfaat Penelitian	6
1.5 Struktur Organisasi Tesis	6
BAB II KAJIAN TEORI	9
2.1 Komposisi Tubuh	9
2.1.1 Lemak Tubuh	10
2.1.2 Massa Lemak Bebas	11
2.1.3 Indeks Massa Tubuh (IMT)	12
2.1.4 Obesitas Usia Subur	13
2.1.5 Dampak Reproduksi	14
2.2 Gangguan Reproduksi	15
2.3 Periode Menstruasi	17
2.4 Dismenore	21
2.5 Aktivitas Fisik Untuk Usia Subur	23
2.5.1 Senam Aerobik	26
2.5.2 Zumba	28
2.6 Kerangka Pemikiran	29
2.7 Hipotesis Penelitian	31
BAB III METODOLOGI PENELITIAN	32
3.1 Desain Penelitian	32
3.2 Partisipan	33
3.2.1 Populasi	33

3.2.2 Sampling	33
3.2.3 Sampel	33
3.3 Instrumen Penelitian	34
3.4 Program Latihan	39
3.5 Analisis Data	40
BAB IV TEMUAN DAN PEMBAHASAN	42
4.1 Deskripsi Data	43
4.2 Hasil Uji Asumsi	43
4.2.1 Hasil Uji Normalitas Kedua Kelompok	45
4.2.2 Hasil Uji Homogenitas Kedua Kelompok	47
4.2.3 Hasil Uji Signifikansi	47
4.2.3.1 Hasil Uji Signifikansi Komposisi Tubuh	48
4.2.3.2 Hasil Uji Signifikansi Siklus Menstruasi Dan Dismenore	50
4.2.3.3 Hasil Uji Signifikansi Perbandingan Pengaruh Kedua Kelompok Pada Komposisi Tubuh	52
4.2.3.4 Hasil Uji Signifikansi Perbandingan Pengaruh Kedua Kelompok Pada Siklus Menstruasi dan Dismenore	53
4.3 Hasil Penemuan Senam Aerobik Dan Zumba Terhadap Komposisi tubuh	53
4.4 Hasil Penemuan Senam Aerobik Dan Zumba Terhadap Siklus Menstruasi Dan Dismenore	55
4.5 Perbandingan Hasil Senam Aerobik Dan Zumba Terhadap Komposisi tubuh	55
4.6 Perbandingan Hasil Senam Aerobik Dan Zumba Terhadap Siklus Menstruasi dan Dismenore	56
4.7 Diskusi Temuan	56
BAB V KESIMPULAN, IMPLIKASI DAN REKOMENDASI	62
5.1 Kesimpulan	62
5.2 Implikasi	62
5.3 Rekomendasi	63
DAFTAR PUSTAKA	64
LAMPIRAN	72

DAFTAR PUSTAKA

- Ahmad, M. F., Amir, M., & Rosli, A. (2015). Effects of Aerobic Dance on Cardiovascular Level and Body Weight among Women. *International Journal of Medical, Health, Biomedical, Bioengineering and Pharmaceutical Engineering*, 9(12), 874–882.
- Ahrens, K. A., Vladutiu, C. J., Mumford, S. L., Schliep, K. C., Perkins, N. J., Wactawski-wende, J., & Schisterman, E. F. (2014). Annals of Epidemiology The effect of physical activity across the menstrual cycle on reproductive function. *Annals of Epidemiology*, 24(2), 127–134. <https://doi.org/10.1016/j.annepidem.2013.11.002>
- Aizawa, T., & Helble, M. (2017). Socioeconomic Inequality in Excessive Body Weight in Indonesia. *Economics and Human Biology*. <https://doi.org/10.1016/j.ehb.2017.09.005>
- Alford, A. J., White, M., Lockwood, L., Hallahan, A., & Davies, P. S. W. (2018). Body composition , dietary intake and physical activity of young survivors of childhood cancer. *Clinical Nutrition*, (March), 1–6. <https://doi.org/10.1016/j.clnu.2018.02.020>
- Amaro-gahete, F. J., Jurado-fasoli, L., Ruiz, J. R., & Castillo, M. J. (n.d.). *Effects of different exercise training programs on body composition: a randomized control trial Different exercise program body composition*. <https://doi.org/10.1111/sms.13414>
- American College of Sports Medicine. (2012). Guidelines for Exercise Testing and Prescription. In *Seventh Edition*.
- An, R., Guan, C., Liu, J., Chen, N., & Clarke, C. (2019). Annals of Epidemiology Original article Trade openness and the obesity epidemic : a cross-national study of 175 countries during 1975 e 2016. *Annals of Epidemiology*, 37, 31–36. <https://doi.org/10.1016/j.annepidem.2019.07.002>
- Bailey, E. J. (2006). *Food Choice and Obesity in Black America : Creating a New Cultural Diet*. London: Praeger.
- Barene, S., Krstrup, P., Jackman, S. R., Brekke, O. L., & Holtermann, A. (2013). Do soccer and Zumba exercise improve fitness and indicators of health among female hospital employees ? A 12-week RCT. *Scandinavian Journal Of Medicine Science In Sports*, 1–10. <https://doi.org/10.1111/sms.12138>
- Bompa, T. O., & Haff, G. G. (2009). *Periodization : Theory And Methodology Of Training* (fifth Edit).
- Boysen, O., Boysen-urban, K., Bradford, H., & Balié, J. (2019). Taxing highly processed foods : What could be the impacts on obesity and underweight in sub-Saharan Africa ? *World Development*, 119, 55–67. <https://doi.org/10.1016/j.worlddev.2019.03.006>
- Chantler, I., Mitchell, D., & Fuller, A. (2009). Actigraphy Quantifies Reduced

- Voluntary Physical Activity in Women With Primary Dysmenorrhea. *YJPAI*, 10(1), 38–46. <https://doi.org/10.1016/j.jpain.2008.07.002>
- Committee on Physical Activity, Health, Transportation, and L. U. (2005). *Does the Built Environment Influence Physical Activity?* Washington DC: The National Academy of Sciences.
- Delextrat, A. A., Warner, S., Graham, S., & Neupert, E. (2016). An 8-Week Exercise Intervention Based on Zumba Improves Aerobic Fitness and Psychological Well-Being in Healthy Women. *Journal of Physical Activity and Health*, 13, 131–139.
- Education, N. A. for S. and P. (2011). *Physical Education for Lifelong Fitness* (Third). Human Kinetics.
- Feinberg, E. C., & Walker, A. (2018). Menstrual cyclicity is predictably unpredictable. *Fertility and Sterility*. <https://doi.org/10.1016/j.fertnstert.2018.11.040>
- Fitness, Z. (2013). *PANDUAN PELATIHAN langkah-langkah dasar LEVEL 1*.
- Ford, E. (2004). Prevalence of the metabolic syndrome in US population. *Endocr Metab Clin N Am*, 33, 333–350.
- Gallus, S., Lugo, A., & Murisic, B. (2015). Overweight and obesity in 16 European countries. *European Journal of Nutrition*, 679–689. <https://doi.org/10.1007/s00394-014-0746-4>
- Giriwijoyo, S. (2017). *Fisiologi Kerja dan Olahraga*. Jakarta: RajaGrafindo Persada.
- Gonzalez-campoy, J. M. (2019). Gonadal Dysfunction and Infertility in Women with Obesity, 283–291.
- Gracia, K. U. (2017). Fase dan Siklus Menstruasi Pada Wanita.
- Guerendiain, M., Villa-gonz, E., & Barranco-ruiz, Y. (2018). Clinical Nutrition Body composition and dairy intake in sedentary employees who participated in a healthy program based on nutrition education and Zumba. *Clinical Nutrition*, (October), 1–10. <https://doi.org/10.1016/j.clnu.2018.09.032>
- Haldar, S., Chia, S. C., & Henry, C. J. (2015). *Body Composition in Asians and Caucasians : Comparative Analyses and Influences on Cardiometabolic Outcomes*. Advances in Food and Nutrition Research (1st ed., Vol. 75). Elsevier Inc. <https://doi.org/10.1016/bs.afnr.2015.07.001>
- Hales, C. M., Fryar, C. D., Carroll, M. D., Freedman, D. S., Aoki, Y., & Ogden, C. L. (2018). Differences in Obesity Prevalence by Demographic Characteristics and Urbanization Level Among Adults in the United States, 2013-2016. *American Medical Association*, 20782(23), 2419–2429. <https://doi.org/10.1001/jama.2018.7270>
- Hammond, B. P., Brennan, A. M., & Ross, R. (2017). Exercise and Adipose Tissue Redistribution in Overweight and Obese Adults. In H. C. Lukaski

- (Ed.), *Body Composition* (pp. 109–128). US: CRC Press.
- Hannah, A., & Johan, S. (2019). Obesity , income and gender : The changing global relationship, 23(September), 267–281.
<https://doi.org/10.1016/j.gfs.2019.09.003>
- Hardman, A. E., & David J. Stensel. (2003). *Physical Activity And Health*. USA And Canada: Routledge.
- Helwa, H. A. A., Mitaeb, A. A., Al-hamshri, S., & Sweileh, W. M. (2018). Prevalence of dysmenorrhea and predictors of its pain intensity among Palestinian female university students. *BMC Women Health*, 18(18), 1–11.
<https://doi.org/10.1186/s12905-018-0516-1>
- Henriksson, P., Leppänen, M. H., Henriksson, H., Nyström, C. D., Cadenas-sanchez, C., Ek, A., ... Löf, M. (2018). Physical fitness in relation to later body composition in pre-school children. *Journal of Science and Medicine in Sport*, xxx–xxx(xxx), 6. <https://doi.org/10.1016/j.jsams.2018.11.024>
- Henry C. Lukaski. (2017). *Body Composition*. New York.
- Hillman, Charles H. Kirk Ericson, S. K. (2008). Be smart, exercise your heart: exercise effects on brain and cognition. *Science and Society*, 9, 58–65.
- Hürter, H., Breda, S. V. Van, Vokalova, L., Brandl, M., Baumann, M., Geyter, C. De, ... Head, D. (2019). Best Practice & Research Clinical Endocrinology & Metabolism Prevention of pre-eclampsia after infertility treatment: Preconceptional minimalisation of risk factors, 33, 127–132.
<https://doi.org/10.1016/j.beem.2019.05.001>
- Jack Fraenkel. (2012). How To Design and Evaluate Research in Education. In *How To Design and Evaluate Research in Education* (8th ed.).
- James WPT, N. R., & Leach, R. (2004). The obesity epidemic, metabolic syndrome and future preventive strategies. *Eur J Cardiovasc Prev Rehabil*, 11, 3–8.
- Jansson, A. K., Lubans, D. R., Smith, J. J., Duncan, M. J., Attia, J., Robards, S. L., & Plotnikoff, R. C. (2019). *Integrating Smartphone Technology, Social Support and the Outdoor Built Environment to Promote Community-based Aerobic and Resistance-based Physical Activity: Rationale and Study Protocol for the ‘ecofit’ Randomized Controlled Trial*. *Contemporary Clinical Trials Communications*. Elsevier Inc.
<https://doi.org/10.1016/j.conctc.2019.100457>
- Julian, R., Hecksteden, A., Fullagar, H. H. K., & Meyer, T. (2017). The effects of menstrual cycle phase on physical performance in female soccer players, 1, 1–13.
- Jusuf, J. B. K. (2013). *PENGARUH SENAM AEROBIK TERHADAP TINGKAT KEBUGARAN JASMANI SISWA PUTRI KELAS VII SMP KARTIKA X11-1 MERTOYUDAN MAGELANG*.
- Kandou, P. R. D., Tombokan, K. C., & Pangemanan, D. H. C. (2017). Hubungan Linda Desrianda Tamher, 2020
PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI TUBUH, SIKLUS MENSTRUASI, DAN DISMENORE PADA WANITA OBESITAS
Universitas Pendidikan Indonesia | Repository.upi.edu | Perpustakaan.upi.edu

antara stres dan pola siklus menstruasi pada mahasiswa Kepaniteraan Klinik Madya (co-assistant), 5.

- Kannan, P., Chapple, C. M., Miller, D., Claydon-mueller, L., & Baxter, G. D. (2019). Effectiveness of a treadmill-based aerobic exercise intervention on pain , daily functioning , and quality of life in women with primary dysmenorrhea : A randomized controlled trial. *Contemporary Clinical Trials*, 81(May), 80–86. <https://doi.org/10.1016/j.cct.2019.05.004>
- Kapoor, N., Endocrine, D. M., Furler, J., Paul, T. V, Endocrine, D. N. B., Thomas, N., & Oldenburg, B. (2019). Normal Weight Obesity: An Underrecognized Problem in Individuals of South Asian Descent. *Clinical Therapeutics*, 41(8), 1638–1642. <https://doi.org/10.1016/j.clinthera.2019.05.016>
- Kemenkes RI. (2018). HASIL UTAMA RISKESDAS 2018.
- Kiyici, F. (2014). Metabolic and lipid profile of middle-aged sedentary women doing aerobic exercise plus weightlifting. *Procedia - Social and Behavioral Sciences*, 116, 3935–3939. <https://doi.org/10.1016/j.sbspro.2014.01.870>
- Kurniawan, A. F., Trisetiyono, Y., & Pramono, D. (2016). MENSTRUASI PADA MAHASISWI FAKULTAS ILMU KEOLAHRAGAAN UNIVERSITAS NEGERI SEMARANG TAHUN 2016. *Jurnal Kedokteran Diponegoro*, 5(4), 298–306.
- Kusumaningrum, T., Nastiti, A. A., & Dewi, L. C. (2019). The Correlation between Physical Activity and Primary Dysmenorrhea in Female Adolescents, 6–10.
- Lee, I., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., ... Group, W. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and. *The Lancet*, 380(9838), 219–229. [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)
- Leung, A., Gregory, N. S., Allen, L. H., & Sluka, K. A. (2016). Regular physical activity prevents chronic pain by altering resident muscle macrophage phenotype and increasing interleukin-10 in mice, 157, 70–79.
- Lghoul, S., Loukid, M., & Hilali, M. K. (2020). Saudi Journal of Biological Sciences Prevalence and predictors of dysmenorrhea among a population of adolescent ' s schoolgirls (Morocco). *Saudi Journal of Biological Sciences*, (xxxx). <https://doi.org/10.1016/j.sjbs.2020.05.022>
- Li, M., Bi, J., Lv, B., Zheng, W., Wang, Z., Xiao, W., ... Li, E. (2019). An experimental study of the anti-dysmenorrhea effect of Chinese herbal medicines used in Jin Gui Yao Lue. *Journal of Ethnopharmacology*, 245(May), 112181. <https://doi.org/10.1016/j.jep.2019.112181>
- Liang, P., Xi, L., Shi, J., Ph, D., Li, W., & Zhao, S. (2017). Prevalence of polycystic ovary syndrome in Chinese obese women of reproductive age with or without metabolic syndrome. *Fertility and Sterility*, (2). <https://doi.org/10.1016/j.fertnstert.2016.12.029>

- Lim, J., Han, K., Young, S., Hye, Y., & Sook, Y. (2019). Obesity Research & Clinical Practice Effects of central obesity on maternal complications in Korean women of reproductive age. *Obesity Research & Clinical Practice*, 13(2), 156–163. <https://doi.org/10.1016/j.orcp.2019.03.004>
- Linne Y. (2004). Effects of obesity on women's reproduction and complications during pregnancy. *Obes Rev*, 5, 137–143.
- Matorras, R., Exposito, A., & Ferrando, M. (2020). Oocytes of women who are obese or overweight have lower levels of n-3 polyunsaturated fatty acids compared with oocytes of women with normal weight, 113(1), 53–61. <https://doi.org/10.1016/j.fertnstert.2019.08.059>
- Matteson, K. A. (2019). Menstrual Health as a Part of Preventive Health Care. *Obstetrics and Gynecology Clinics of NA*, 46(3), 441–453. <https://doi.org/10.1016/j.ogc.2019.04.004>
- Matthewman, G., Lee, A., Chb, M. B., & Kaur, M. J. G. (2018). Physical activity for primary dysmenorrhea: a systematic review and meta-analysis of randomized controlled trials. *American Journal of Obstetrics and Gynecology*. <https://doi.org/10.1016/j.ajog.2018.04.001>
- Mitchell, A., & Fantasia, H. C. (2016). UNDERSTANDING THE EFFECT OF OBESITY REPRODUCTIVE-AGE WOMEN. *Nursing for Women's Health*, 20(4), 368–376. <https://doi.org/10.1016/j.nwh.2016.07.001>
- Molina, M., López, O., Ma, J., Reyes, M., Burgos, R., & De, L. G. (2011). Influence of physical activity and dietary habits on lipid profile, blood pressure and BMI in subjects with metabolic syndrome.
- Mulyana. (2018). Masa Usia Subur. Retrieved from <https://www.bkkbn.go.id/>
- Mulyaningsih, F. (n.d.). *SENAM AEROBIK SEBAGAI WAHANA PENGEMBANGAN KREATIVITAS INSTRUKTUR*.
- Nastiti, C. L., Fitri, M., & Sultoni, K. (2020). The Impact of Water Aerobics and Aerobics Dance on Body Mass Index and Fat Percentage, 21(Icsshpe 2019), 247–250.
- Naugle, K. M., Fillingim, R. B., & Riley, J. L. (2012). A Meta-Analytic Review of the Hypoalgesic Effects of Exercise. *The Journal of Pain*, 13(12), 1139–1150. <https://doi.org/10.1016/j.jpain.2012.09.006>
- Ok, G., Ahn, J., & Lee, W. (2019). Maturitas Association between irregular menstrual cycles and occupational characteristics among female workers in Korea. *Maturitas*, 129(July), 62–67. <https://doi.org/10.1016/j.maturitas.2019.07.019>
- Omron Healthcare. (2008). *Instruction Manual Full Body Sensor Body Composition Monitor and Scale*.
- Ortiz, A. E., & Escobar, H. F. (2019). Obesity and Reproduction, 2, 543–552. <https://doi.org/10.1016/B978-0-12-801238-3.66100-7>

- Palar, C. M. (2015). MANFAAT LATIHAN OLAHRAGA AEROBIK TERHADAP KEBUGARAN FISIK MANUSIA. *Jurnal E-Biomedik*, 3(April), 316–321.
- Pasquali, R., Patton, L., & Gambineri, A. (2007). Obesity and infertility, 482–487.
- Pengpid, S., & Peltzer, K. (2019). Diabetes & Metabolic Syndrome : Clinical Research & Reviews Underweight and overweight or obesity and associated factors among school-going adolescents in five ASEAN countries , 2015. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 13(6), 3075–3080. <https://doi.org/10.1016/j.dsx.2019.11.002>
- Pickett-blakely, O., & Uwakwe, L. (2016). Obesity in Women and Reproductive Health and Disease Management. *Gastroenterology Clinics of NA*, 45(2), 317–331. <https://doi.org/10.1016/j.gtc.2016.02.008>
- Price, S. A., Proietto, J., Nankervis, A., & Permezel, M. (2018). Preconception management of women with obesity : A systematic review, (September), 1–17. <https://doi.org/10.1111/obr.12804>
- Proverwati & Misaroh. (2009). *Menarche: Menstruasi pertama penuh makna*. Yogyakarta: Nuha Medika.
- Purwoastuti & Wahyuni. (2015). *Panduan Materi Kesehatan Reproduksi dan Keluarga Berencana*. Yogyakarta: Pustaka Baru Press.
- Rachmi, C. N., Li, M., & Baur, L. A. (2017). Overweight and obesity in Indonesia : prevalence and risk factors d a literature review, 7. <https://doi.org/10.1016/j.puhe.2017.02.002>
- Rakhmawati, A. (2012). *Hubungan obesitas dengan kejadian gangguan siklus menstruasi pada wanita dewasa muda*.
- Riva L. Rahl. (2010). *Physical Activity And Health Guidelines*. USA: Human Kinetics.
- Rizka, M. (2018). PENGARUH LATIHAN JALAN KAKI TERHADAP KEBUGARAN JASMANI LANSIA DI PUSKESMAS SUNGAI AUR KABUPATEN PASAMAN BARAT. *Stamina*, 1, 206–218.
- Roemling, C., & Qaim, M. (2012). Obesity trends and determinants in Indonesia q. *Appetite*, 58(3), 1005–1013. <https://doi.org/10.1016/j.appet.2012.02.053>
- Ruano, C., Lucumi, E., Albán, J., Arteaga, S., & Fors, M. (2018). Obesity and cardio-metabolic risk factors in Ecuadorian university students. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 1871–4021(1003), 5. <https://doi.org/10.1016/j.dsx.2018.05.015>
- Saghebjoo, M., Nezamdoost, Z., Ahmadabadi, F., & Saffari, I. (2018). Diabetes & Metabolic Syndrome : Clinical Research & Reviews The effect of 12 weeks of aerobic training on serum levels high sensitivity C-reactive protein , tumor necrosis factor-alpha , lipid profile and anthropometric characteristics in middle-age women patients with type 2 diabetes. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 12(2), 163–168.

<https://doi.org/10.1016/j.dsx.2017.12.008>

- Samy, A., Zaki, S. S., Metwally, A. A., Salah, D., Mahmoud, E., Elzahaby, I. M., ... Mb, A. (2019). Original Study The Effect of Zumba Exercise on Reducing Menstrual Pain in Young Women with Primary Dysmenorrhea : A Randomized Controlled Trial. *Journal of Pediatric and Adolescent Gynecology*, 1–5. <https://doi.org/10.1016/j.jpag.2019.06.001>
- Sanchez, G. . L., Radziminski, L., Skalska, M., Jastrzebska, J., Smith, L., Wakuluk, D., & Jastrebski, Z. (2019). Body composition , physical fitness , physical activity and nutrition in Polish and Spanish Female student of sport sciences. *Sciene & Sports*, 8. <https://doi.org/10.1016/j.scispo.2019.04.002>
- Sant, J. E., Pereira, M. G. A. G., Dias, V. J., Dambrós, C., Costa-neto, C. M., & Souza, H. C. D. (2011). Autonomic Neuroscience : Basic and Clinical Effect of the duration of daily aerobic physical training on cardiac autonomic adaptations. *Autonomic Neuroscience: Basic and Clinical*, 159(1–2), 32–37. <https://doi.org/10.1016/j.autneu.2010.07.006>
- Seif, M. W., Diamond, K., & Nickkho-amiry, M. (2015). Best Practice & Research Clinical Obstetrics and Gynaecology Obesity and menstrual disorders. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 29(4), 516–527. <https://doi.org/10.1016/j.bpobgyn.2014.10.010>
- Sermondade, N., Huberlant, S., Bourhis-, V., Arbo, E., Gallot, V., Colombani, M., & Fréour, T. (2019). Female obesity is negatively associated with live birth rate following IVF: a systematic review and meta-analysis, 1–13. <https://doi.org/10.1093/humupd/dmz011>
- Sharafi, S. E., Garmaroudi, G., Ghafouri, M., Bafghi, S. A., Ghafouri, M., Tabesh, M. R., & Alizadeh, Z. (2019). Prevalence of anxiety and depression in patients with overweight and obesity. *Obesity Medicine*, 100169. <https://doi.org/10.1016/j.obmed.2019.100169>
- Shin, C., Lee, Y., & Belyea, M. (2018). Physical activity , benefits , and barriers across the aging continuum. *Applied Nursing Research*, 44(February), 107–112. <https://doi.org/10.1016/j.apnr.2018.10.003>
- Silva, D. A. S., Petroski, E. L., & Pelegrini, A. (2014). EFFECTS OF AEROBIC EXERCISE ON THE BODY COMPOSITION AND LIPID PROFILE, 36(2), 295–309.
- Simbolon, P., Sukohar, A., & Ariwibowo, C. (2016). Hubungan Indeks Massa Tubuh Dengan Lama Siklus Menstruasi Pada Mahasiswi Angkatan 2016 Fakultas Kedokteran Universitas Lampung Relationship Of Body Mass Index With The Length Menstrual Cycle At Student Class Of 2016 Faculty Of Medicine , University Of Lampung, 7(6), 164–170.
- Sinaga, E., Saribanon, N., Sa'adah, S. N., Salamah, U., Murti, Y. A., Trisnamiati, A., & Lorita, S. (2017). *Manajemen Kesehatan Menstruasi*.
- Sugiarti, N., & Noor, Z. (2008). Pengaruh Program Olahraga Umum (Senam Aerobik) dan Khusus (Body Language dan Senam Aerobik) terhadap Linda Desrianda Tamher, 2020
- PENGARUH SENAM AEROBIK DAN ZUMBA TERHADAP KOMPOSISI TUBUH, SIKLUS MENSTRUASI, DAN DISMENORE PADA WANITA OBESITAS
- Universitas Pendidikan Indonesia | Repository.upi.edu | Perpustakaan.upi.edu

- Penurunan Berat Badan The Influence of Ordinary (Aerobic Exercise) and Special Sport Program (Body Language and Aerobic Exercise) on Weight Loss. *Mutiara Medika*, 8(1), 1–8.
- Sulton, K., Jajat, & Fitri, M. (2017). Health-Related Fitness Knowledge and Its Relation to College Student Physical Activity Health-Related Fitness Knowledge and Its Relation to College Student Physical Activity. *IOP Conference Series: Materials Science and Engineering PAPER*, 012212(180), 5. <https://doi.org/10.1088/1742-6596/755/1/011001>
- Talmor, A., & Bruce, D. (2014). Female Obesity and Infertility. *Best Practice & Research Clinical Obstetrics & Gynaecology*, xxx(5), 1–9. <https://doi.org/10.1016/j.bpobgyn.2014.10.014>
- Teychenne, M., White, R. L., Richards, J., Schuch, F. B., & Bennie, J. A. (2019). Do we need physical activity guidelines for mental health: what does the evidence tell us? *Mental Health and Physical Activity*, (1–22), 100315. <https://doi.org/10.1016/j.mhpa.2019.100315>
- Thong, E. P., Codner, E., Laven, J. S. E., & Teede, H. (2019). Review Diabetes : a metabolic and reproductive disorder in women. *THE LANCET Diabetes & Endocrinology*, 8587(19). [https://doi.org/10.1016/S2213-8587\(19\)30345-6](https://doi.org/10.1016/S2213-8587(19)30345-6)
- Towner, E. K., Ph, D., Kapur, G., D, M., Carcone, A. I., Ph, D., ... Ph, D. (2019). Physical Activity as a Predictor of Changes in Systolic Blood Pressure for African-American Adolescents Seeking Treatment for Obesity. *Journal of Adolescent Health*, 65(3), 430–432. <https://doi.org/10.1016/j.jadohealth.2019.04.001>
- Tugusi, L., Manca, A., Bergamin, M., & Blasio, A. Di. (2018). Zumba Fitness and Women , s Cardiovascular Health, (March 2017). <https://doi.org/10.1097/HCR.0000000000000326>
- Ubago-guisado, E., Javier, S., & Vila-maldonado, S. (2019). Effects of Zumba ® and Aquagym on Bone Mass in Inactive Middle-Aged Women. *Medicina*, 55(23), 1–10. <https://doi.org/10.3390/medicina55010023>
- Wadrianto, G. K. (2018). Tips Menghitung Masa Subur Berdasarkan Siklus Menstruasi. Retrieved from <https://lifestyle.kompas.com/read/2018/04/08/070000820/tips-menghitung-masa-subur-berdasarkan-siklus-menstruasi?page=all>.
- WHO. (2019a). Obesity. Retrieved from <https://www.who.int/topics/obesity/en/>
- WHO. (2019b). Obesity and overweight. Retrieved November 6, 2018, from <http://who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- Yacubovich, Y., Cohen, N., Tene, L., & Kalichman, L. (2019). Journal of Bodywork & Movement Therapies The prevalence of primary dysmenorrhea among students and its association with musculoskeletal and myofascial pain. *Journal of Bodywork & Movement Therapies*, (xxxx). <https://doi.org/10.1016/j.jbmt.2019.05.006>

