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Effects of walking training performed using continuous and interval methods on weight loss as effective strategies among postpartum women

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Effects of walking training performed using continuous and interval methods on weight loss as effective strategies among postpartum women

Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Data Interpretation
- E Manuscript Preparation
- F Literature Search
- G Funds Collection

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abstract

Background: Walking is a fundamental and affordable physical activity that improves entire body and helps women lose weight. However, some studies suggest that walking alone has little or no effect on improving or maintaining body mass and fat mass at the hip and spine. The objective of this study is to estimate the effect of walking intensity (interval training vs. traditional cardio) on weight loss after childbirth.

Material and methods: A total of 39 postpartum women [19 experimental subjects (ES) and 20 controls (CS)] participated in this study. Their homogenates were calculated based on their average age of 25 ± 2.54 years. BMI obese moderate and waist circumference at high-risk, first deliveries to the same educational and social status. The subjects participated in this study to lose excess weight within three months after childbirth.

Results: Our results indicate that interval training with fast walking is a powerful tool for developing successful strategies for managing weight loss.

Conclusions: We recommend that postpartum women, who use walking to amplify their weight loss, use the following exercise schedule: at least three sets of 400 m (wf \approx SR) \times 5 per day, nine 400 m (wf \approx SR) \times 5 sets per week, and 36 sets of 400 m (wf \approx SR) \times 5 per month.

Key words: walking, weight loss, newborn mothers, intensity.

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INTRODUCTION

Pregnant women experience significant functional and physical changes to nurture and accommodate the developing foetus. These changes affect all of the body's systems [1] at the beginning of the pregnancy, during the pregnancy, and after the childbirth [2]. Body weight and its association with the lipid profile is determined before and after the pregnancy [3]. Body weight and its association with an increase in heat shock protein relative to basal metabolic rate [4] and resting metabolic rate [5] is similarly determined. As a response to estrogen, the body requires more oxygen at rest. In addition, insulin requirements and thyroid size also increase [6]. Previous studies have shown that hormones induce many physical changes in women, which lead to metabolic disorders [7]. Pregnancy results in significant physical and psychological changes in women [8]. Previous studies confirm that regular physical activity is associated with improved physiological, metabolic and psychological parameters as well as reduced risk of morbidity [9]. Physical activity is recommended as part of any weight loss plan. High levels of physical exercise require higher energy expenditure. Walking is a rhythmic, dynamic and aerobic activity of large skeletal muscles that has multiple benefits and minimal adverse effects [10]. Ruth K. Anderson suggests to walking fast for 15 minutes 3 days per week (15–20 fast repetitions) to improve aerobic capacity related to weight loss [11]. According to the American College of Sports Medicine [12], high-intensity walking is more beneficial for women compared with normal walking. Gary Kamen suggests that high-intensity exercises are a major determinant of the energy expenditure balance, which is correlated with higher oxygen debt coupled with resting metabolism [13].

Thus, this comparative study aims to estimate the relationship between walking intensity and its impact on weight loss after childbirth. Previous studies confirm that walking as a regular physical activity improves the cardiovascular function, limits weight gain, reduces musculoskeletal awkwardness, decreases incidence of muscle cramps and lower limb oedema, improves mood stability, gestational diabetes mellitus and gestational hypertension. Furthermore, this exercise can be performed at three different levels of intensity (i.e., low, moderate and vigorous), which are correlated with energy substrates during the expended effort. When performing this exercise, it is possible to experiment with multiple training methods: intermittent, interval training or continuous. In this study, interval training in ES vs. traditional cardio in CS was used as a protocol for monitoring weight loss in ES. In CS, the use of the continuous method for 30 minutes 4 times a week reduced the risk of heart disease, diabetes, obesity, osteoporosis, and other health problems [14]. This differs from ES, who used interval training. Interval training consists of two phases: speed walking followed by slow walking as a recovery phase. For example, 400 m of speed walking followed by 100 m of slow recovery (5 fast repetitions of this exercise). Walking can be performed as brisk walking or as other variations (e.g., speed walking, power walking and race walking) to improve physical fitness. According to Frank Rosato [15], fast walking is a satisfactory activity.

Previous studies indicate that more people perform slow walking (34%) than fast walking (24%) [16]. The purpose of our study is to test the benefit of walking on managing the body weight. The condition of the study is that all participants follow a diet regime (1200–1500 calories per day). The participants' goal is to lose weight to improve fitness, health and well-being.

MATERIAL AND METHODS

All participants are volunteers. Their reason for participation is to lose extra weight. Postpartum women practice walking as a favourite sport to lose weight. The participants' age is between 24 and 27 years. Their BMI is between 27 and 30. The participants reported that they exercised <3 days/week for <50 minutes/day during the 3 months prior to this study. All participants followed a diet that was designed to lower weight (1200–1500 calories per day). The inclusion criteria were as follows: all lifestyle parameters were fixed (both groups followed the same diet and lifestyle), the women were not pregnant and did not have any medical conditions that disrupted metabolism or body weight or limited ability to exercise.

As an intervention, exercise intensity was prescribed according to the protocol used in this study [interval training (ES) vs. traditional cardio (CS)] for 3 months after childbirth. The CS group walked for 30 minutes four times a week at their own pace using the continuous method. The ES group began their program using the 12 × 100 m (wf ≈ SR) series and then changed to the 5 × 400 m (wf ≈ SR) series at the end of three months. To evaluate the progress, we measured the body weight (to the nearest 0.1 kg) and height (to the nearest 0.5 cm) without shoes using standard medical equipment [17]. BMI was determined using the following formula: body mass (kg) divided by height (m) squared. According to a previous study [18], 1-mile walk (Rockport Walk Test) can be used as a valid predictor of VO₂max (as an alternative to the 1.5-mile run test) in assessing cardiovascular and aerobic fitness. Waist circumference (WC) was measured at midpoint between the lower margin of last palpable rib and the top of iliac crest [19]. Our data tests (pre- or post-test) were analysed using IBM SPSS 21.0. The means and standard deviations were determined, and the independent T-test and correlation paired samples with a statistical significance set at P < 0.05 were performed.

RESULTS

The postpartum women are categorised as obese (Moderate or Level 1), based on the BMI values provided by the Japan Society for the Study of Obesity [20]. The VO₂max values of our participant were in the Fair class range. The waist circumference values were greater than 88 cm (35 in.), which represented an elevated health risk [21]. According to McTiernan [22], the women were metabolically at a high risk of metagenome, which could result in them gaining ≥5 kg of body weight. Thus, our results are in agreement with cross-sectional and longitudinal studies. This suggests that childbearing may be an important contributor to the development of obesity [23]. The pre-test values indicated an inverse relationship between physical activity levels and dietary fat consumption [24] and the well-being of postpartum women [25]. Health experts indicate a relationship between obesity and a decrease in physical activity [26] in this population, which is indicated by Steindorf et al. as insufficiently physically active. Physical activity promotion programs should target women in particular need [27]. In this study, we advanced the interval methods with faster walking to improve walking fitness and to achieve greater weight loss. Similarly to continuous walking as a form of physical activity, interval or intermittent walking had positive effects on weight loss, as indicated by a previous study [28].

Table 1 summarises details about our participants at the beginning of the study (pre-test).

Table 1. Summary of studies addressing the effect of pregnancy on a woman's body

Variables	Sample	No.	Mean±SD	T		Shapiro-Wilk		Levene's	
				V	P	V	P	V	P
Weight (Kg)	ES	19	72.16 ±4.73	0.04	0.96	0.97	0.83	1.37	0.09
	CS	20	72.11 ±3.83						
Height (M)	ES	19	160.36 ±5.36	0.35	0.73	0.96	0.37	0.44	0.73
	CS	20	159.75 ±5.75						
1-MILE (MN)	ES	19	15.89 ±0.96	0.77	0.45	0.94	0.96	0.68	0.72
	CS	20	16.16 ±1.18						
BMI (kg/m ²)	ES	19	28.05 ±1.06	0.57	0.51	0.93	0.51	2.13	0.64
	CS	20	28.29 ±1.50						
VO ₂ max (ml/MN/kg)	ES	19	30.94 ±1.86	0.69	0.49	0.92	0.64	2.18	0.83
	CS	20	31.45 ±2.64						
WC (Cm)	ES	19	113.11 ±5.55	0.27	0.78	0.93	0.55	0.06	0.27
	CS	20	113.56 ±4.84						

Our results confirm that walking has many benefits for postpartum women including cardiorespiratory fitness, heart health, postural development, bone density, injury rehabilitation, pain management, muscle strength and endurance, mobility, stability, balance and body awareness [29]. Record in this study by the significance of independent t-test in favour of the Es group in all comparisons applied. See table 2. Highlight by the researcher in the value of VO₂max. ES is listed in the average category, and CS is listed in the below average category [30]. Both ES and CS groups are up to the average fitness level, and the general population values is set at 35.2 (mL/MN/kg), [31]. Based on BMI and WC, as measures of obesity, we recorded a reduction in BMI values relative to WC values (i.e., 2 cm for ES and 1 cm for CS). These results are associated with a decrease in a 1-mile walking time.

McDougal et al. suggest the decrease in BMI and WC correspond to the enhancement in 1-mile walk time performance [32]. Walking as a dynamic sports activity helps decrease lipid storage using femoral depot [33]. Similar studies indicate that walking helps increase aerobic capacity and decrease body fat [34]. Thus, it is strongly recommended to make walking an essential part of a successful weight loss program. Walking allows reducing body weight by 2–5% [35]. Based on an independent t-test and paired samples, this study demonstrated significant benefits of walking for the ES group. These results were found to be significant in the post-test. Similar studies confirm that high-intensity interval training methods can help reduce fat content in overweight people [36]. Results of O'Sullivan et al. can be used as a reference guide for walking. The researchers suggest to starting with a self-selected comfortable speed and then increase the speed to fast walking [37]. Thompson et al. [38] recommend walking as fast as possible to activate insulin switch, reverse insulin resistance, lose weight and prevent diabetes.

Table 2 and Fig. 1 present the results from the studies that address the influence of walking intensity on weight loss after childbirth.

Table 2. Results from the studies that address the influence of walking intensity on weight loss after childbirth

Variables	Sample	No.	Mean±SD	T		Shapiro-Wilk	
				V	P	V	P
1-MILE (MN)	ES	19	12.36±0.83	-2.33	0.01	-0.64**	0.96
	CS	20	13.25±1.51				
BMI (kg/m ²)	ES	19	26.49±0.91	-2.25	0.03	0.62**	0.51
	CS	20	27.39±1.50				
VO ₂ max (ml/MN/kg)	ES	19	39.40±1.73	-2.22	0.03	0.72**	0.64
	CS	20	36.87±2.48				
WC (Cm)	ES	19	110.07±3.31	-2.07	0.04	0.88**	0.89
	CS	20	112.83±4.84				

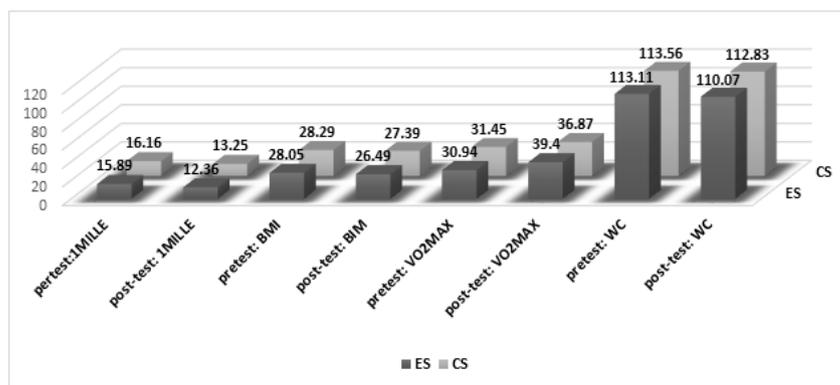


Fig 1. Results from the studies that address the influence of walking intensity on weight loss after childbirth

DISCUSSION

Our research examines the effects of walking intensity on weight loss after childbirth. Pregnant and postpartum women experience significant short-term and long-term challenges [39] including physical changes and medical complications [40]. Several studies have shown that excess weight after pregnancy is associated with excess weight gain [41]. Walking intervention programs, particularly shorter ones, have little or no effect on improving or maintaining body mass and fat mass at the hip and the spine [42]. In addition, these programs have a low effect on weight loss [43]. Similar studies confirm that the more women walk, the less weight gain they have [3, 28]. Our study proves the benefits of walking for the ES group to achieve more weight loss. In addition, intensive walking increases aerobic capacity due to the increase in anaerobic fitness, which is associated with skeletal muscle adaptation (oxidative and glycolysis) [36]. This is accompanied by the improvement in maximal oxygen uptake and endurance performance [44]. Previous studies have shown that walking improves cardiorespiratory fitness and reduces side effects of sex hormones in obese women [45]. Similar to the other studies, our results confirm that walking enhances cardiovascular fitness and results in substantial health benefits to improve the quality of life, social well-being and general health [46]. High-intensity interval training is an efficient approach for developing cardiovascular fitness [47]. The abovementioned information confirms our assumptions and our results. Fast walking burns twice the amount of calories compared with slow walking (48). The results of both groups (ES and

CS) confirm that walking is the preferred exercise for people who need to increase their physical activity as part of their overall strategy for sustainable weight loss [49]. However, based on the results of the ES group, we support the hypothesis that high intensity is needed to reach a sufficiently high target heart rate to achieve the best fat burning [50].

CONCLUSIONS

This study showed that high intensity walking for extended periods of time burns more calories due to the energy expenditure balance, which is correlated with higher oxygen debt and the working metabolic rate compared with the resting metabolic rate. Our approach includes a speed phase, which is associated with a positive active recovery, as a beneficial method for increasing the benefits of walking. Speed develops the anaerobic zone, just like the aerobic zone is developed via resistance training or cardiovascular interval training. Previous studies confirm that this approach is able to generate clinically meaningful weight loss results with only 15 minutes of exercise per day [51].

This study shows that intensive walking improves performance of postpartum women. Walking improves cardiac and respiratory fitness, decreases BMI and WC and helps resolve changes in a woman's body caused by pregnancy. Our approach can help postpartum women obtain a healthy body weight. In addition, walking as a daily physical activity can boost aerobic activity of large skeletal muscles, which provides many health benefits with minimal adverse effects [10].

APPLICABLE CONCLUSIONS

- Walking is the preferred exercise for people who need to increase their physical activity as part of their overall strategy for sustainable weight loss.
- Fast walking and interval training help postpartum women achieve greater weight loss.

REFERENCES

- [1] Lockitch G. Clinical biochemistry of pregnancy. *Crit Rev Clin Lab Sci.* 1997;34(1):67-139. <https://doi.org/10.3109/10408369709038216>
- [2] O'Day MP. Cardio-respiratory physiological adaptation of pregnancy. *Semin Perinatol.* 1997;21(4):268-75. [https://doi.org/10.1016/S0146-0005\(97\)80069-9](https://doi.org/10.1016/S0146-0005(97)80069-9)
- [3] Oostvogels AJJM, Busschers WB, Spierings EJM, Roseboom TJ, Gademan MGJ, Vrijkotte TGM. Pre-pregnancy weight status, early pregnancy lipid profile and blood pressure course during pregnancy: The ABCD study. *PLoS One.* 2017;19(12(5)):e0177554. <https://doi.org/10.1371/journal.pone.0177554>
- [4] King TL, Brucker MC, Fahey J, Kriebs JM, Gegor CL. *Varney's midwifery.* Burlington, MA: Jones & Bartlett Learning; 2015.
- [5] Sharlin J, Edelstein S. *Essentials of life cycle nutrition.* Sudbury, MA: Jones and Bartlett; 2010.
- [6] Slone McKinney E, James SR, Smith Murray S. *Maternal-child nursing.* St. Louis, Missouri: Elsevier/Saunders; 2013.
- [7] Zerf M, Mokkedes MI, lakhdar M, Hakim H, Bengoua A. The benefits of physical activity for health and well-being case menopausal women. *Eur J Phys Educ Sport.* 2016;13(3):108-112. <http://doi.org/10.13187/ejpe.2016.13.108>
- [8] Linnard-Palmer L, Haile Coats G. *Safe maternity and pediatric care.* Philadelphia, F.A.: Davis Company; 2016.
- [9] Melzer K, Schutz Y, Boulvain M, Kayser B. Physical activity and pregnancy: cardiovascular adaptations, recommendations and pregnancy outcomes. *Sports Med.* 2010;40(6):493-507. <http://doi.org/10.2165/11532290-000000000-00000>
- [10] Barton H, Thompson S, Burgess S, Grant M. *The Routledge handbook of planning for health and well-being.* London: Routledge; 2015. <http://doi.org/10.4324/9781315728261>
- [11] Anderson RK. *Get moving! Live better, Live longer.* Bloomington: Xlibris Corp; 2010.
- [12] Bushman B, American College of Sports Medicine. *ACSM's complete guide to fitness & health: Physical activity and nutrition guidelines for every age.* Champaign, Ill.: Human Kinetics; 2011.

- [13] Kamen G. Foundations of exercise science. Philadelphia: Lippincott Williams & Wilkins; 2001.
- [14] Caron M. Walking for fitness: The beginner's handbook. New York: Greystone Books, a division of D & M; 2009.
- [15] Rosato F. Walking and jogging for health and wellness. Belmont, CA: Wadsworth, Cengage Learning; 2012.
- [16] O'Brien Cousins S. Exercise, aging, and health: Overcoming barriers to an Active old age. UK: Taylor & Francis; 1998.
- [17] Mohammed Z, Moulay Idriss M, Amer Belkacem Nora B, Fatiha M. Anthropometric risk index and their association with lipid profiles among married versus spinster. Jundishapur J Health Sci. 2017 Jul;9(4):e12769. <http://doi.org/10.5812/jjhs.12769>
- [18] Weiglein L, Herrick J, Kirk S, Kirk EP. The 1-mile walk test is a valid predictor of VO_{2max} and is a reliable alternative fitness test to the 1.5-mile run in U.S. Air Force males. Mil Med. 2011 Jul;176(6):669-73. <http://doi.org/10.7205/MILMED-D-10-00444>
- [19] Tharpe N, Farley CL, Jordan RG. Clinical practice guidelines for midwifery & women's health. Burlington, Massachusetts: Jones & Bartlett Learning; 2017.
- [20] Oomura Y. Progress in obesity research 1990 In: Proceedings of the 6th International Congress on Obesity, held in Kobe, Japan, 21-26 October 1990. London u.a: Libbey; 1991.
- [21] Allison DB, Baskin ML. Handbook of assessment methods for eating behaviors and weight related problems: Measures, theory and research. London: SAGE; 2009.
- [22] McTiernan A. Cancer prevention and management through exercise and weight control. London: CRC Press; 2016.
- [23] Larson-Meyer DE. Effect of postpartum exercise on mothers and their offspring: A review of the literature. Obesity Res. 2002;10:841-853. doi.org/10.1038/oby.2002.114.
- [24] May LE. Physiology of prenatal exercise and fetal development. New York: Springer; 2012. <http://doi.org/10.1007/978-1-4614-3408-5>
- [25] Milunsky A, Friedman EA, Gluck L. Advances in perinatal medicine. Volume 3. Boston, MA: Springer US; 1983. <http://doi.org/10.1007/978-1-4684-4421-6>
- [26] Betty J. Ackley, Gail B. Ladwig. Nursing Diagnosis Handbook: An Evidence-Based Guide to Planning Care London: Elsevier Health Sciences; 2010.
- [27] Steindorf K, Chang-Claude J, Flesch-Janys D, Schmidt ME. Public Health Nutrition. Publ Health Nutr. 2010;13(11):1905-14. <http://doi.org/10.1017/S13688980010001965>
- [28] Maczka M, Sass A, Wojtyla A. Assessment of physical activity among pregnant women in context of weight gain in pregnancy. J Educ Health Sport. 2017; 7(6):332-376.
- [29] Nottingham S, Jurasin A. Your path to a lean, strong, and fit physique. Leeds: Human Kinetics; 2010.
- [30] Evans CH, White RD. Exercise stress testing for primary care and sports medicine. London: Springer; 2008. <http://doi.org/10.1007/978-0-387-76597-6>
- [31] Great Britain Parliament. Independent Review of Police Officer and Staff Remuneration and Conditions. London: Stationery Office; 2012.
- [32] McDougal WS, Wein AJ, Kavoussi LR, Partin AW, Peters C. Campbell-Walsh urology eleventh edition review. Philadelphia, PA: Elsevier; 2016.
- [33] Tessier S, Riesco E, Lacaille M, et al. Impact of walking on adipose tissue lipoprotein lipase activity and expression in pre- and postmenopausal women. Obesity Facts. 2010;3(3):191-9. <http://doi.org/10.1159/000314611>
- [34] U.S. Department of Health and Human Services. Report of the Advisory Committee on Research on Women's Health: Office of Research on Women's Health and NIH Support for Research on Women's Health Issues. Public Health Service: National Institutes of Health; 2001.
- [35] Gaetano Crepaldi, Antonio Tiengo, Angelo Avogaro. The Metabolic Syndrome: The Road Map from Inflammation to Cardiovascular Disease London: Elsevier; 2007.
- [36] Boutcher SH. High-intensity intermittent exercise and fat loss. J Obes. 2011;2011:868305. <http://doi.org/10.1155/2011/868305>
- [37] O'Sullivan SB, Schmitz TJ. Improving functional outcomes in physical rehabilitation. Philadelphia: F.A. Davis Company; 2016.
- [38] Thompson R, Carpenter D. The insulin resistance solution: reverse pre-diabetes, repair your metabolism, shed belly fat, prevent diabetes. Beverly, Massachusetts: Fair Winds; 2016.
- [39] Fitzgerald C, Segal N. Musculoskeletal health in pregnancy and postpartum: An evidence-based guide for clinicians. Cham: Springer; 2015. <http://doi.org/10.1007/978-3-319-14319-4>
- [40] Verster JC, Pandi-Perumal SR, Streiner DL. Sleep and quality of life in clinical medicine. Totowa, NJ: Humana Press; 2008. <http://doi.org/10.1007/978-1-60327-343-5>
- [41] Nicholson W, Baptiste-Roberts K. Obesity during pregnancy in clinical practice. London: Springer; 2014. <http://doi.org/10.1007/978-1-4471-2831-1>
- [42] Marcus R, Feldman D, Dempster DW. Osteoporosis. Amsterdam: Elsevier/Academic Press; 2013.
- [43] Cuberek R, Gába A, Svoboda Z, et al. Walking in the lifestyle of elderly women with a sedentary occupation. Olomouc: Palacký University Olomouc; 2014. <http://doi.org/10.5507/ftk.14.24443775>
- [44] Gist NH, Fedewa MV, Dishman RK, Cureton KJ. Sprint interval training effects on aerobic capacity: a systematic review and meta-analysis. Sports Med. 2014;44(2):269-79. <http://doi.org/10.1007/s40279-013-0115-0>
- [45] Kong Z, Fan X, Sun S, Song S, Shi Q, Jinlei N. Comparison of high-intensity interval training and moderate-to-vigorous continuous training for cardiometabolic health and exercise enjoyment in obese young women: A randomized controlled trial. PLoS One. 2016;11(7):e0158589. <http://doi.org/10.1371/journal.pone.0158589>

- [46] International Transport Forum, Organisation for Economic Co-operation and Development. Pedestrian safety, urban space and health: Research report. Paris: OECD Publishing; 2012.
- [47] Milanović Z, Sporiš G, Weston M. Effectiveness of high-intensity interval training (hit) and continuous endurance training for vo2max improvements: A systematic review and meta-analysis of controlled overweight/obese women. Arquivos Brasileiros de Cardiologia. 2009;93(5):519-25. <http://doi.org/10.1002/osp4.109>
- [48] Fett CA, Fett WC, Marchini JS. Circuit weight training vs jogging in metabolic risk factors of overweight/obese women. Arquivos Brasileiros de Cardiologia. 2009;93(5):519-25. <http://doi.org/10.1590/S0066-782X2009001100013>
- [49] Rippe JM, Weight Watchers. Weight loss that lasts: break through the 10 big diet myths. Hoboken, N.J: John Wiley & Sons; 2005.
- [50] Isoldi KK. The woman's day guide to lasting weight loss. Filipacchi: Godalming: Melia; 2008.
- [51] Pizzorno JE, Murray MT. Textbook of natural medicine. Edinburgh: Churchill Livingstone; 2012.

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