Nursing Science Quarterly
2014, Vol 27(1) 30–36

DOI: 10.1177/0894318413509706
nsq.sagepub.com
SAGE

Prenatal Yoga in Late Pregnancy and Optimism, Power, and Well-Being

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Abstract

The study reported here explored changes in optimism, power, and well-being over time in women who participated in a six-week prenatal yoga program during their second and third trimesters of pregnancy. The study was conceptualized from the perspective of Rogers' science of unitary human beings. A correlational, one-group, pre-post-assessment survey design with a convenience sample was conducted. Increases in mean scores for optimism, power, and well-being were statistically significant from baseline to completion of the prenatal yoga program. Findings from this study suggested that yoga as a self-care practice that nurses might recommend to promote well-being in pregnant women.

Keywords

optimism, power, prenatal, Rogers, science of unitary human beings, well-being

Women commonly report the use of a number of complementary and alternative therapies during pregnancy, among these is yoga. An estimated 20% of women in the United States (US) practice yoga while pregnant (Adams et al., 2009). The developing research suggests that prenatal yoga practice may contribute to greater optimism and fewer pregnancy-related discomforts. Also emerging is support for improved birth outcomes such as higher birth weight and decreased risk for preterm birth in women who practice yoga during pregnancy (Narendran, Nagarathna, Narendran, Gunasheela, & Nagendra, 2005).

Yoga is a popular activity that has been reported to promote health and wellness during pregnancy contributing to prenatal comfort and support for childbirth in several ways. The gentle stretching that occurs during yoga positions (asanas) helps relieve musculoskeletal discomforts of pregnancy and prepares the pelvic and lower extremity muscles for childbearing

(Chuntharapat, Petpichetchian, & Hatthakit, 2008). Breathing and relaxation techniques of yoga promote improved respiratory capacity that alleviates pregnancy-related shortness of breath and enhances breathing during labor (Narendran et al., 2005). Prenatal yoga practice has been reported to result in less pregnancy discomfort, greater maternal comfort and self-efficacy during labor, and facilitation of the labor process (Chuntharapat et al., 2008; Sun, Hung, Chang, & Kuo, 2010). In terms of pregnancy outcomes, yoga practice has been proposed to confer a buffering effect resulting in higher birth weight, lower incidence of preeclampsia, decreased risk for preterm birth, less likelihood of urgent cesarean birth and reduced risk of fetal demise (Narendran, et al., 2005). According to Iyengar (2001), the creator of a derivation of Hatha yoga known as Iyengar yoga, the practice of yoga "fills up the reservoirs of hope and optimism within you" (p. 9).

While there has been interest in optimism and the power of positive thinking for decades, evidence is emerging that suggests a relationship among optimistic disposition, physical and psychological health, and well-being during pregnancy (Grote & Bledsoe, 2007). Lobel, Yali, Zhu, DeVincent, and Meyer (2002) found that optimistic women who were experiencing a high-risk pregnancy were more likely to view their pregnancy as controllable. and were more prone to utilize adaptive coping than less optimistic women who chose avoidant coping. In other studies, optimism emerged as a significant predictor of physical health, even when effect size is adjusted for factors such as demographics, health status, risk, and relevant psychosocial characteristics (Rasmussen & Scheier, 2009).

Rogers (1986) proposed the science of unitary human beings conceptual system as an evolving framework with "a humane and optimistic view of life's potentials …suggesting optimism as a unitary phenomenon" (p. 4). Furthermore, the interpretation of optimism, manifested as hopefulness and confidence about the future with a tendency to look favorably upon life is congruent with Rogers' philosophical beliefs about unitary human beings. Therefore, in Rogers' science,

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the manifestation of optimism conveys patterning of the human-environmental energy field, and differences in optimism among individuals reflect diversity of field patterning. The science of unitary human beings is concerned with evolving human and environmental field patterning associated with well-being (Rogers, 1970). Therefore the aim of this study, guided by Rogers' (1970, 1992) science of unitary human beings, was to explore human-environmental field patterning changes in optimism, power, and well-being over time, in women during the second and third trimesters of pregnancy and upon completion of a six-week prenatal yoga program.

Theoretical Framework

An analysis of the writings of Rogers over time suggests that her worldview of health evolved to a preference for the term well-being to reflect the unitary conceptualization of health and illness. In one of her last publications, Rogers stated in a discussion of nursing that "if our primary purpose is promotion of health, well-being is a much better term because the term health is very ambiguous" (Rogers, 1994, p. 34). Viewing the experience of individuals with a well-being lens conveys a positive and optimistic perspective of life.

Power is the capacity to participate knowingly in change, demonstrated as continuous patterning of the human-environmental field (Barrett, 2003; 2010). Barrett's theory of power (2010) derived from the Rogers' homeodynamic principle of helicy describes the nature and direction of change as continuous, innovative, unpredictable, and increasing diversity of human and environmental field pattern (Rogers, 1992). Power has been described as an observable pattern manifestation of awareness, choices, freedom to act intentionally, and involvement in creating change to promote well-being (Barrett, 2003).

Power is posited to be related to the unitary concept of well-being. Kim, Kim, Park, Park, and Lee (2008) tested the relationship of power to well-being using Barrett's Power as Knowing Participation in Change Tool (2003) and the Rogerian science-derived Well-being Picture Scale (WPS) (Gueldner et al., 2005) in 881 South Korean men and women. Power and well-being were significantly correlated ($r = .52$, $p < .001$) and power accounted for 27% of the variance of the well-being. The authors' findings lend support to the relationship of power and well-being.

Within Rogers' science, well-being is the manifestation of the three homeodynamic principles (resonancy, helicy, and integrality) as higher frequency (resonancy), increased diversity of energy field motion (helicy) within the mutual human-environmental field process (integrality) (Rogers, 1992). The concept of motion is described in Rogers' (1970) science as a manifestation of dynamic, continuous, and creative change in the human life process. Rogers (1992) stated that patterning is the visible manifestation of field motion that characterizes the process of change. Patterning can be objectively measured by instruments derived within the theoretical framework of the science of unitary human beings (Alligood & Fawcett, 2004). Frequency, action, awareness, and power are posited to be empirical constructs of human field motion and rhythm that are amenable to testing and measurement (Gueldner et al., 2005). Health-related variables unique to Rogerian science, such as perceived field motion and human field rhythms are posited to contribute synergistically to a sense of well-being. Patterning of well-being manifests as balance and harmony of human field motion and rhythm. Therefore, yoga is proposed as a holistic practice that is congruent with the unitary perspective and therapeutic aims of the science of unitary human beings to promote well-being.

Purpose

The purpose of this study was to explore changes in human-environmental field patterning (manifestation) of optimism, power, and well-being over time in women during the second and third trimesters of pregnancy and upon completion of a six-week prenatal yoga program.

Research Questions

1. What changes in patterning are observed through the manifestation of optimism, power, and well-being over time, in women before beginning (baseline) and upon completing a six-week prenatal yoga program during the second and third trimesters of pregnancy?
2. Does change in patterning, as observed through the manifestations of optimism, power, and well-being over time differ for women beginning a six-week prenatal yoga program in the third trimester from women who begin the program in the second trimester of pregnancy?

Research Design

The variables of optimism, power, and well-being were measured using a correlational, one-group, pre-post-assessment survey design to answer the two research questions. Since optimism is a widely reported variable that was measured in this study, power was calculated using Cohen's (1988) paired-samples *t* test formula and the means and standard deviations of the Life Orientation Test-Revised (LOT-R) (Scheier, Carver, & Bridges, 1994) scores as reported in the literature. Sample size was estimated assuming a moderate effect size, power of 80%, a significance level of .05, and an estimate of variability as reported in the literature. Sample size information from the literature for pregnant women was limited; therefore estimates were computed for various realistic values of variability and correlations between pre- and post-LOTR scores revealing a sample size range of 20 to 32 for the study.

Sample

A convenience sample of 27 pregnant women was recruited from a public health prenatal clinic and a private nurse-midwifery practice in the Southeastern United States. The sample included women who volunteered to participate in the study and were (a) in the second and third trimesters of pregnancy between 20 to 32 weeks gestation; (b) 18 years old and above; (c) able to speak, read, and write in English; and (d) experiencing an uncomplicated, low-risk pregnancy. The inclusion criteria chosen for the study were based on the review of literature and were consistent with other studies of yoga practice during pregnancy.

Instruments

Demographic Survey

A demographic survey to collect information about the participants including age, nationality, education, income, marital status, employment status, gestational age, parity, level of exercise, previous yoga experience, previous and concurrent use of complementary and alternative therapies, general perceived health status, and problems incurred during the pregnancy was utilized to obtain a description of the sample.

Life Orientation Test-Revised (LOT-R)

Optimism was measured by the Life Orientation Test-Revised (LOT-R) (Scheier, et al., 1994), a 10-item self-report measure of personal differences in optimism and pessimism. The instrument contains six items to derive an optimism score, and four filler items that are eliminated from the statistical analysis. The theoretical framework from which the LOT-R is derived is behavioral self-regulation which assumes that expectancies about likely outcomes determine whether or not individuals strive to pursue goals, or withdraw or disengage from goals that are viewed as unattainable (Carver & Scheier, 2003). Within this view, individuals hold general expectancies about the holistic quality of their lives, and optimism is beneficial to learning to cope with change. The LOT-R is a modification of the Life Orientation Test (LOT) first developed by Scheier and Carver (1985). According to Carver and Scheier (2003) the LOT-R focuses more explicitly on expectations for the future as dictated by the theory that guided the development of the LOT. Examples of items from the LOT-R are: "In uncertain times, I usually expect the best" and "If something can go wrong for me, it will" (Scheier et al., 1994, p. 1073). Respondents are asked to indicate their level of agreement with each item on a Likert scale with items scored as follows: 0 = strongly disagree; 1 = disagree; 2 = neutral; 3 = agree; and 4 = strongly agree. Negatively worded items are reverse coded before scoring. A summary score of the six-scale items is calculated after removing the four filler items and scores, resulting in a range of scores from 0 to 24. Higher scores are associated with greater optimism. The LOT-R has been shown to be reliable in pregnant women, with Cronbach's alpha reported as .81 to .85 (Grote & Bledsoe, 2007; Lobel et al., 2002; & Moyer et al., 2009). In the current study, the Cronbach's alpha was .88 at Time 1 and .87 at Time 2.

Power as Knowing Participation in Change Tool Version II (PKPCT v II)

Power was measured by the Power as Knowing Participation in Change Tool version II (PKPCT v II) (Barrett, 2003; 2010) with higher scores associated with greater power. The PKPCT v II is a 7-point semantic differential scale used to measure the operational indices of power manifested as awareness, choices, freedom to act intentionally, and involvement in creating change. The PKPCT v II has four subscales of 12 bipolar adjective pairs and one repeat adjective pair as a retest reliability item. Participants are instructed to make a separate rating for each adjective pair by checking the space that best reflects the meaning of the concept to them. Each space on the scale represents a numeric value of 1 to 7. Scale scores are summed with a range of scores from 12 to 84 for each power concept and 48 to 336 for the total power score. Mean scores for general populations vary widely, ranging from 67-336 (Epstein et al., 2004; Kim et al., 2008). Adjective pairs are reversed randomly throughout the PKPCT v II.

The PKPCT v II is reported to be a reliable measure of power, with Cronbach's alpha most often reported as .85 and higher (Barrett, 2010; Kim et al., 2008). Test-retest reliability from .61 to .78 within a 3-week interval has been reported in a population of undergraduate students (Barrett, 2003). In the current study, the PKPCT v II total score alpha reliability was .95 at Time 1 and .97 at Time 2.

Well-being Picture Scale (WPS)

Well-being was measured by the *Well-being Picture Scale* (WPS) (Gueldner et al., 2005) with higher scores associated with greater well-being. The WPS is a 10-item pictorial scale that measures general well-being based on characteristics of field energy motion that are posited to represent well-being. Conceptually, the instrument appraises the energy field in regard to frequency and intensity of movement, awareness of oneself as energy, action emanating from the energy field, and power as knowing participation in change within the mutual human and environmental energy field process. Each item on the scale has a numeric value of 1 to 7, with 70 being the maximum score possible and 10 being lowest score possible. Higher scores indicate higher well-being.

Short-Form 12 Version 2.0 (SF-12v2)

For an integrated science of unitary human being view, the Short Form-12 version 2 (SF-12v2) (Ware, Kosinski, Turner-Bowker, & Gandek, 2009) Physical Component Summary

Table 1. Healthy Moms® Prenatal Yoga Class Format.

"Checking In": Women in the prenatal yoga group share any changes they've experienced over the past week and goals for the current session as desired	5 minutes
"Centering": Visualization and breathing exercises in seated or lying down poses bolstered by pillows to keep the back elevated	5 minutes
"Warm-up": Neck rolls, shoulder exercises, and side stretches in seated position	10 minutes
"Flow": Standing positions which may include a modified sun salutation pose, Kegel exercises, and a sequence of positions that gradually transition the woman toward the mat for mat exercises	10 minutes
Standing positions: Warrior pose, balancing positions, and wall positions to strengthen the quadriceps and shoulders	5 minutes
"Mat Work": Seated positions and hip rotation exercises	10 minutes
"Savasana" or "corpse pose": Modified to left side-lying position	10 minutes
Meditation	.5 minutes

(Healthy Moms®, 2012).

(PCS) and Mental Component Summary (MCS) were used as auxiliary measures of unitary well-being. The PCS and MCS as composite measures represent the synthesis of several dimensions of health that contribute to a sense of well-being.

The SF-12v2 is a measure of health-related quality of life and contains 12 items from the SF-36 Health Survey (Ware & Sherbourne, 1992) that measure each of the eight domains of health included in the SF-36: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health, in addition to two summary scores – the physical component summary (PCS) and the mental component summary (MCS). The PCS score addresses physical functioning, role physical, bodily pain, and general health and the MCS score addresses vitality, social functioning, role emotional, and mental health domains of the SF-12 v2. Summary component scores range from 0 to 100 and are calculated using the scores of the 12 scale items; higher scores represent greater health. Standardized norm-based scoring algorithms for all Short-Form surveys utilize a M =50 and SD=10 for comparison to the national norms for the United States (Ware et al., 2009). The SF-12v2 is available in standard (4-week) and acute (1-week) recall formats. The four-week recall version was chosen for this study.

Data Collection Procedure

Human subjects' protection approval was obtained from the review boards and agencies involved in the study. Study participants were solicited at their scheduled prenatal appointments through a flyer kept in the examination rooms at their prenatal care provider's clinic or office. Women who agreed to participate in the study responded to the study instrument packet ordered as follows: (a) demographic survey, (b) WPS, (c) LOT-R, (d) PKPCT v II, and (e) SF-12 v2. The study instrument packet was administered one to two weeks prior to beginning yoga classes (Time 1) and one to two weeks after the conclusion of the six-week yoga classes (Time 2).

The demographic survey was collected on enrollment into the study. The Time 1 study instrument packet was given to participants either at their prenatal appointment, mailed with a return postage-paid envelope enclosed, or sent by email attachment by the investigator. The Time 2 study instrument packet was either mailed or sent via email attachment to the participants by the investigator. In addition to completing the study instrument packets at Time 1 and Time 2, participants were given a yoga journal to record their daily experience of yoga practice for six weeks and a yoga mat that was theirs to keep. The journal included space to record the date, amount of time spent practicing yoga, whether or not they attended class, and how they felt after practicing yoga. Space was also provided for the participants to record additional thoughts and feelings about their yoga experience. Upon completion of the six-week yoga session, participants returned the yoga journals to the investigator. In addition, each participant was interviewed by phone and was asked: "Describe the experience of practicing yoga during this pregnancy. Include as much as you can about your perceptions, feelings, sensations, and behaviors. Include any changes or surprises that you've experienced."

Participants attended the Healthy Moms® prenatal yoga program once a week consecutively for six weeks at one of three yoga studio locations. The timeframe of six weeks for prenatal yoga practice sessions was selected based upon a review of the literature that described the duration of instructor-led prenatal yoga classes from one month (Satyapriya, Nagendra, Nagarathna, and Padmalatha, 2009) to 12 to 14 weeks (Sun, et al., 2010). Healthy Moms® is a national perinatal health and wellness company that is "dedicated to promoting successful health and wellness programs to new expectant moms…before, during and after pregnancy" (Healthy Moms®, 2012). (See Table 1 for details)

The American Congress of Obstetricians Committee Opinion on Exercise during Pregnancy and the Postpartum Period (2002) does not include specific advice about yoga practice or similar exercises that involve gentle stretching and non-aerobic physical activity. However, according to the position statement a thorough evaluation of all pregnant women should be conducted before recommending an exercise program as was accomplished in this study.

Table 2. Means, Standard Deviations, Potential Ranges, Obtained Ranges, and Cronbach's alpha.

TIME 1

Measures	*n*	*M*	*SD*	Potential Range	Obtained Range	Cronbach's α
LOT-R	21	16.43	4.12	0-24	5-23	.88
PKPCT v II	21	248.43	33.87	48-336	193-248	.95
WPS	21	47.52	8.90	10-70	31-70	.87
PCS	20	46.57	6.25	*M 50; SD 10	33-58	**
MCS	20	49.98	8.60	*M 50; SD 10	34-61	**

*Norm-based scores for the general population
**Test-retest reliability is a more appropriate estimate of PCS and MCS scale reliability (Ware, Kosinski, Turner-Bowker, & Gandek, 2009, *User's Manual for the SF-v2 Health Survey*, p. 66).

TIME 2

Measures	*n*	*M*	*SD*	Potential Range	Obtained Range	Cronbach's α
LOT-R	21	18.29	3.59	0-24	8-23	.87
PKPCT v II	21	270.09	37.60	48-336	218-332	.97
WPS	21	52.19	9.73	10-70	26-70	.90
PCS	20	43.46	8.51	*M 50; SD 10	25-55	**
MCS	20	54.80	5.04	*M 50; SD 10	44-61	***

* Norm-based scores for the general population ** PCS Test-retest reliability coefficient = .60 *** MCS Test-retest reliability coefficient = .685

Results

Description of the Sample

Of the 27 women who consented to participate in the study, six withdrew from the study prior to completing the six-week yoga program. Three withdrew because of pregnancy-related complications: one after three classes because of pelvic pain, one after two classes due to vaginal bleeding, and one after one class upon receiving a diagnosis of placenta previa. Three withdrew by not attending yoga classes after submitting the Time1 study packet at baseline.

The final sample of 21 women enrolled in yoga classes for six weeks and completed the study instruments one to two weeks before beginning classes (Time 1) and at one to two weeks following the completion of yoga classes (Time 2). The participants ranged in age from 22 to 38 years (M = 30.28; SD = 5.01).

Twelve participants reported having practiced yoga in the past; however none of the women were currently practicing yoga. Although none of the study participants reported that they were currently practicing yoga, five reported that they were currently using, or have in the past utilized breath work and breathing techniques for relaxation and stress relief, four reported using relaxation techniques in the past, and four reported using massage in the past.

Data Analysis

Data were evaluated for completeness. Frequency distributions were checked to identify extreme or inconsistent values. Descriptive statistics were used to describe the participants. The means, standard deviations, potential and obtained ranges, and Cronbach's alpha coefficients for Time 1 and Time 2 are presented in Table 2. An alpha level of .05 was used as the criterion for statistical significance. The majority of participants (n = 12) attended yoga classes for six weeks; five participants attended classes for five weeks, three attended classes for four weeks, and one attended class for three weeks. To answer the first research question, changes in patterning, as observed through the manifestation of optimism (LOT-R), power, (PKPCT v II), and well-being (WPS) were measured over time. An analysis of the change in mean scores at baseline (Time 1) and following the six-week prenatal yoga program (Time 2) was tested using paired-samples, two-tailed t test of significance to evaluate changes in scores for optimism, power, and well-being from Time 1 to Time 2. The t test analysis is reported here. There was a statistically significant increase in mean scores from Time 1 to Time 2 for optimism (t (20) = 4.41, p = < .001, eta squared = .49), power (t (20) = 3.15, p = .005, eta squared = .33) and well-being t (20)= 2.57, p = .018, eta squared = .25). The increase in MCS scores from Time 1 to Time 2 was also statistically significant (t (19) = 3.41, p =.003, eta squared = .38). While PCS scores from Time 1 to Time 2 decreased overall, the decrease in scores did not reach statistical significance.

Because of the small sample size the non-parametric Mann-Whitney U Test was used to address the second research question by computing gain scores. The difference in mean gain scores for the LOT-R, PKPCT v II, and WPS for women in the second and third trimesters of pregnancy

were explored. Participants were divided into two groups according to which trimester they were in when they entered the study. Women from 20 to 28 weeks gestation were considered to be in the second trimester of pregnancy and women at 29 weeks and above were considered to be in the third trimester. Gain scores were computed based upon the mean change in scores from Time 1 to Time 2 among the participants. The Mann-Whitney U Test did not reveal a statistically significant difference in gain scores for women who entered the study in the second trimester from those who entered in the third trimester of pregnancy.

Discussion

The researcher used Rogers' science of unitary human beings as a theoretical basis to explore changes in patterning of optimism, power, and well-being in women during the second and third trimesters of pregnancy upon completion of a six week prenatal yoga program. Rogers' framework views pregnancy from a positive standpoint of health, wholeness, and well-being in contrast to conceiving pregnancy as a medical event focused on signs and symptoms of pathology. The science of unitary human beings presents an optimistic worldview of health and well-being in which individuals have the capacity to participate in change toward maximization of health potentials (Rogers, 1970). Well-being is patterning of functional and positive changes within living systems that conveys a holistic conceptualization of human-environmental interrelationships.

To answer the first research question, in this study patterning changes manifested over time as increased optimism, power, and well-being for the group as a whole. In response to the second research question, an analysis of gain scores as a predictor of change over time in optimism, power, and well-being revealed no significant differences for women who entered the study in the second trimester of pregnancy from those who entered in the third trimester.

From a methodological perspective there are strengths and limitations with this study. To the investigator's knowledge, this study is the first to explore patterning of optimism, power, and well-being from the science of unitary human beings perspective before and after a prenatal yoga program in late pregnancy. The LOT-R, PKPCT v II, and WPS, instruments used to measure optimism, power, and well-being in this study were found to be reliable and stable over time. The test-retest reliability of the SF-12 v2 PCS and MCS in this study was less consistent, suggesting the need for further study.

Another strength of the study was the ethnic and sociodemographic diversity of the participants, all of whom reported that yoga was a beneficial practice for them. The positive appraisal of yoga practice regardless of nationality or sociodemographic status is an encouraging finding that adds to the body of knowledge about perceptions of yoga practice in underrepresented pregnant women.

Participants were asked to keep a journal in order to capture day-to-day and week-to-week observations about their experiences of practicing yoga in class and at home. The comments were positive revealing the importance of yoga practice to general health and well-being. One woman said "I have started to notice that doing yoga is a necessity to make it through the day." Another commented that as a result of yoga practice "I find strength even when I'm exhausted." Others said yoga kept them in a "good mood" made them "feel happy" and helped them feel "relaxed and ready to sleep". While most women prior to participating in the study perceived yoga as very beneficial (n = 10) or beneficial (n = 8), several stated that the experience of prenatal yoga classes and practicing yoga at home exceeded their expectations in terms of how yoga practice enhanced their sense of well-being. The majority of women reported that they found yoga classes physically challenging, however no injuries due to yoga practice were reported. In addition to small sample size purposeful sampling, reliance on self-report measures, absence of a control group, and lack of random assignment limit the generalizability of the findings.

Conclusions and Implications

Pregnancy is a transformative time during which the well-being of mothers is critical to optimal birth outcomes. The experience of pregnancy presents unique challenges for which yoga practice has been demonstrated to be beneficial. Implications for nursing theory and research include the need to replicate the study utilizing a more rigorous study design and statistical approach. While some researchers call for a "dismantling approach" to better define and discern what specific elements are evaluated in a yoga intervention, others warn that since yoga is an inherently holistic practice, a dismantling approach may fail to capture essential core elements of yoga practice (Curtis, Weinrib, & Katz, 2012). A dismantling approach would be reductionistic and counter to a holistic Rogerian view which was the framework used in the current study. Future studies could include outcome measures such as duration of labor, maternal and fetal tolerance of labor, postpartum maternal mood state, sleep patterns, and adaptation to the parenting role in women who practiced yoga during pregnancy and in those who did not practice yoga. From the emerging knowledge contributed by this study, nurses and other healthcare professionals may benefit by increased awareness of holistic practices such as yoga on optimism, power, and well-being during late pregnancy from a unitary nursing science perspective.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the authorship and/or publication of this column.

Funding

The author received no financial support for the authorship and/or publication of this column.

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