California Association for Health, Physical Education, Recreation and Dance

e-Journal

Inside this Issue

2018-2019 Board of Directors 3

President's Message 4

Editor's Message 6

Peer-Reviewed Articles:

Assessing the Effect of a College-Level Nutrition Course on Kinesiology Student Knowledge 7

Eric Conrad, M.S.
Department of Health Science
The University of Alabama, Tuscaloosa

Brent Powell, Ph.D.
Department of Kinesiology
California State University, Stanislaus

Ruben Taranjo, B.S.
Department of Health Science
The University of Alabama, Tuscaloosa

Kelly Hall, M.S.
Department of Kinesiology
University of Northern Colorado, Greeley

Comparisons of Measured Body Composition and Self-Perception of Body Type In Racially and Ethnically Diverse Male and Female College Students 15

Mark W Baldis, Ph.D.
Department of Kinesiology
California State University, Fresno

Tim Anderson, Ed.D.
Department of Kinesiology
California State University, Fresno

Michael Coles, Ph.D.
Department of Kinesiology
California State University, Fresno

Supply and Demand Data for California Physical Education Teachers 20

James Wyant, Ph.D.
College of Physical Activity and Sport Sciences
West Virginia University, Weston

Kristi Wyant, M.S.
Department of Health, Exercise, and Sport Sciences
University of the Pacific, Stockton

Call for Papers 27

CAHPERD Conference 28

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President's Message

Welcome and thank you ALL for expressing further interest and desire for another CAHPERD e-Journal. Thank you to Dr. Chris Gentry for serving as Editor-in-Chief and to Dr. Paul Stuhr who is taking over as Editor-in-Chief for the coming year. I am honored to share some thoughts regarding research.

First and foremost, every organization needs a research component. We cannot not conduct research. Research takes on many different shapes and forms. From the personal, exploratory nature of qualitative to the rigorous, in-depth, statistical driven quantitative, research has the ability to define an organization. Take a look at your new mobile phone application or even within numerous sports organizations where 'analytics' have played a major role in selection of certain player. In other words, research can be found in so many different aspects within our lives.

Specifically, our HPERD field serves as a tremendous opportunity for high quality theory and applied based research. Numerous members of CAHPERD work in higher education and have direct ties to the Kinesiology options that can be of great assistance to CAHPERD. The fields of pedagogy, sports medicine, public heath, and exercise science conduct research that can aid our organization. Also, our connections to numerous credential programs throughout the state can lend assistance by examining the latest trends in teacher education. We are surrounded by opportunities to gain tremendous knowledge through research and more importantly, explaining the value of the data and results from the research. Think about it, over the last 15 or so years, how many of us have quoted and or cited research regarding obesity and test scores, the more fit a student the higher the test score (correlation or causation aside)? How many of us have looked at the CDC PowerPoints on obesity? How many of us mentioned the works of Dr. John Ratey, Dr. Charles Hillman, Eric Jensen, Dr. John Medina, Dr. Kenneth Cooper, and many others. Even 'newer' terms within our field such as physical literacy, social justice and culturally sustaining pedagogies are supported by research. Research is everywhere and it has the ability to bring credibility and professionalism to CAHPERD. Look at the wealth of textbooks within pedagogy and health that have surged within our HPERD field over the last 15 years and the longevity of journals such as Strategies, JOPERD and Research Quarterly for Exercise and Sport. To me, research has the power to sustain an organization.

President's Message (Cont.)

Therefore, it is my pleasure to report that CAHPERD has revived the Student Poster Session at the annual state conference, and it was a great success at the recent 'Our Time' event in Garden Grove. We will continue to build on this program, providing great opportunities for all conference attendees to see, share, collaborate and discuss current research in our field.

Finally, thank you all for supporting me as your President (and most recently Cindy Lederer and Dr. Brent Powell). It has been a tremendous challenge and honor. Special thanks to all members of the current BOD, as well as BA, Shelby Heinlein, Marci Pope and James Clemmer. To Seth Martin, enjoy the ride, you will have great support!!!!

See you all at the CAHPERD 'In Focus' 2020 Conference next February!!

Tim Hamel
2018 – 2019 President

Editor's Message

It is our pleasure to provide the CAHPERD Membership with another strong edition of the CAHPERD e-Journal. The continued growth of the publication and the scope of the articles that have been submitted demonstrates the passion that our state faculty and teachers have for sharing their knowledge and research with others.

Once again, this journal includes authorship from several dedicated faculty members and teachers from the state of California and beyond. These authors expand our knowledge and show a willingness to work together by going outside of their university for collaborations. This edition includes research articles from professors across the country. Student research guided by strong mentors is also included in this journal. Such research allows future scholars to grow and possibly consider careers as university faculty.

As always, we encourage submissions from faculty, K-12 educators, and undergraduate and graduate students across HPERD. Please consider the journal for both original research articles and teaching tips. This is an organization that survives off of the support and leadership of teachers and future professionals, and as a result, the aim of this journal is to increase the knowledge base of those individuals. This journal would not be possible without you!

We hope that you enjoy these articles, and we look forward to providing you with future editions of your state journal.

Sincerely,

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Past VP of Physical Education
Department of Kinesiology
CSU, San Bernardino

Associate Editor
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Inside this Issue

Note: The opinions of authors and the topics accepted for publication do not necessarily represent the viewpoints of CAHPERD or the CAHPERD leadership.

Peer Reviewed Article

Assessing the Effect of a College-Level Nutrition Course on Kinesiology Student Knowledge

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ABSTRACT

The purpose of this study was to assess nutrition knowledge among Kinesiology students in order quantify student understanding of fundamental nutrition principles and determine if differences were significant between students who had completed a college-level nutrition course versus those who had not. It was hypothesized that students who completed a college nutrition course would score significantly higher in each categorical domain as well as total knowledge. Kinesiology students were surveyed utilizing a validated instrument to assess fundamental nutrition knowledge. Specific emphasis was placed on recruiting students who had completed a college-level nutrition course. Question items were categorized into four distinct categorical domains including: sources of nutrients, dietary recommendations, identification of optimal dietary choices, and awareness of diet-disease relationships. Students who had previously completed a college-level nutrition course (n = 62) scored significantly higher than those who had not (n = 46) for dietary recommendations (7.36 ± 1.92 and 6.61 ± 1.93, p = .047), sources of nutrients (40.16 ± 9.65 and 35.72 ± 9.63, p = .02), and total score (57.48 ± 13.11 and 51.07 ± 13.48, p = .014). There was no significant difference between groups associated with dietary choices (p = .174) and diet-disease relationship (p = .126). Overall, students who completed a college-level nutrition course attained higher knowledge scores than those who did not. While there was a difference in knowledge, total percent correct answers for both groups were well below the established cutoff by content raters indicating a need to further assess pedagogical content within nutrition courses and its articulation to knowledge questionnaires.

Keywords: nutrition, kinesiology students, knowledge.

Introduction

Within the current health care system, dietitians are uniquely trained to provide nutritional services and education to the community. However, access to dieticians within a community may not be easily accessible or practical and therefore the role of nutrition educator may necessitate health and wellness professional to perform this task in an auxiliary capacity (Ettienne-Gittens et al., 2012). In order for professionals to adequately serve in this capacity, it is necessary to have fundamental knowledge and application skills to effectively communicate and disseminate nutrition information.

With a strong push by organizations such as the Centers for Disease Control and Prevention (CDC) for schools to adopt a coordinated approach to school health such as the Whole School, Whole Community, Whole Child (WSCC) model, various professionals must collaborate in order to address key priority areas including nutrition. School professionals and those who work closely with youth populations are uniquely positioned to promote nutrition and establish healthy eating habits that can be sustained for a lifetime. Allied health professionals are "health care practitioners with formal education and clinical training who are credentialed through certification, registration and/or licensure" (Health Professions Network, 2013, para 1.) and are ideally suited to deliver nutrition education due to prolonged contact with the professional during visits. Public health educators are concerned with improving the health of individuals and communities through the education and adoption of healthy behaviors including proper nutrition. Oftentimes professionals in health education and public health work with underserved, low income populations whom may not have access to medical care via physicians and dieticians, with the only sources of information and education coming from those health education and public health specialists. Due to the potential for these professionals to serve as auxiliary nutrition educators, it is essential they possess competence in fundamental nutrition knowledge to better assist the populations they serve.

The California Education Code does not mandate the instruction of nutrition education from grades kindergarten through 12 but instead uses indistinct language that "encourages" nutrition education, instructional activity from knowledgeable instructors, and a supportive administration (CAL Educ Code § 8990, § 8993, § 8995). Due to this lack of policy mandating nutrition education at the state level, the decision to include nutrition education is relegated to individual school districts. In order to assist in this process, the California State Board of Education adopted the California Health Education Content Standards (HECS) in 2008 and published the California Nutrition Education Competencies (CNEC) in 2011. These standards define necessary content students should know in order to promote health and nutrition literacy, but their content is not mandated or required to be taught to California youth. If future professionals are already acquiring this knowledge as a supplement during their elementary, middle, and high school education, an independent college level nutrition course may not be warranted.

The concern becomes whether state and local nutritional standards and guidelines are being taught to school age children and adolescents and whether this fundamental knowledge is adequate for those entering professions that necessitate nutrition knowledge. The U.S Department of Education (2000) determined that the average time spent addressing nutrition education by public school teachers were less than 13 hours per year. Nutrition education is included in many national and local health education content standards. Currently there is evidence that supports a lack of knowledge and preparation among these professionals to effectively and accurately provide nutrition education (Jeffries & Matthias, 2007; Sack, Raddler, Mairella, Touger-Decker, & Khan, 2009; Torres-McGehee, Pritchett, Zippel, Minton, Cellamare, & Sibilia, 2012; Ettienne-Gittens, Lisako, McKyer, Goodson, Guidry, & Outley, 2012). This inadequacy should necessitate the reevaluation of professional preparation programs to assess if graduates possess fundamental nutritional knowledge necessary to serve as a resource for schools and the community.

California State University, Stanislaus

Kinesiology courses at California State University, Stanislaus provide a background in physical education for those planning to enter the teaching field, an educational foundation for those planning to undertake graduate work, or a program for preprofessional work in fitness, education, coaching, and allied health fields. The coursework necessary to fulfill program requirements varies based on the individual track option selected by the students. A large majority of the students within the Department of Kinesiology choose the track option that provides a concentration in health and wellness promotion, and is often utilized by those who plan to

enter allied health fields or as an option to pursue a graduate degree. A smaller percentage of students within the Kinesiology Department are pursuing the track option for a singular degree in Kinesiology or Kinesiology single-subject preparation program in physical education. Kinesiology track options and their alignment to eventual career paths are presented in Figure 1.

Within these track options, students pursuing the concentration in health and wellness are the only segment within the major that are required to enroll in and complete a college-level nutrition course in order to meet graduation requirements. The inconsistency regarding nutrition education between track options leads the researchers to ponder the potential relevance and necessity of such a course within the Kinesiology curriculum. The benefit of college-level nutrition education for future professionals whose profession may require fundamental nutrition knowledge to disseminate information in an auxiliary capacity may be minimal. It is possible that students choosing to major in Kinesiology may have acquired the basic knowledge through elementary, middle, and high school education making a singular nutritional course superfluous. The reverse may also be true; students in the department of Kinesiology may lack adequate content knowledge and application skills to effectively serve as a resource indicating a need for the college-level nutrition course to be maintained and potentially incorporated into all track options. The purpose of this study was to assess nutrition knowledge of Kinesiology students in order quantify student understanding of fundamental nutrition principles and determine any potential difference between students who have completed a college-level nutrition course versus those who had not. Additionally, the researchers aim to ascertain whether students, regardless of nutrition course completion, are able achieve fundamental nutrition proficiency as determined by a criterion reference performance standard. The researchers expect that individuals who have completed a college-level course will score significantly higher than those who have not.

Methods

Participants

The University Institutional Review Board approved the research study upon confirmation of informed consent, which was obtained via the online system used to develop and administer the survey; the Qualtrics Software System. Inclusion in the study was limited to students at California State University, Stanislaus currently declared within the Department of Kinesiology. This convenience sample was a representation of students who plan to pursue careers where nutrition education may be incorporated in an auxiliary capacity. Only students age 18 and older were included in the study and were recruited from current declared majors through department email as well as interpersonal communication to increase participation rates. Further promotion of the study was incorporated through requests for participation in individual course classrooms in which Kinesiology students were enrolled. Specific emphasis was placed on recruiting Kinesiology students that completed a college-level nutrition course. Participation of all volunteers was voluntary and assured of the maintenance of confidentiality and the anonymity of responses. To avoid possible coercion or undue influence, the survey was voluntary and in no way was language for participation coercive.

Instrument and Data Analysis

The instrument utilized to assess nutrition knowledge among Kinesiology students was a modified questionnaire originally developed by Parmenter and Wardle (1999) to be utilized for studying the relationship between nutrition knowledge, demographics, and dietary behavior. Question items were categorized into four distinct sections including: Sources of nutrients, dietary recommendations, identification of optimal dietary choices, and awareness of diet-disease relationships. Original measures of the questionnaire established construct validity and attained high internal reliability (Cronbach's $\alpha = 0.70\text{-}0.97$) and test-retest reliability with an overall measure of 0.97

(Parmenter & Wardle, 1999). Question items were modified to reflect cultural differences in terminology and food alternatives as the original questionnaire was utilized in the United Kingdom. The modified questionnaire contained 54 questions of which 11 were independent variables related to demographic information. The remaining questions assessing nutrition knowledge were comprised of 98 individual items for scoring. Prior to primary study implementation, the questionnaire was piloted among students not currently majoring in the Department of Kinesiology in order to reduce ambiguity and maximize clarity of questions and their content.

The data were extracted from Qualtrics and imported into the Statistical Package for the Social Sciences (SPSS). The knowledge questions were coded to represent correct and incorrect answers and descriptive statistics were assessed in both groups within the study. An analysis of data included independent t-tests to assess statistically significant differences between knowledge scores within each survey section and groups within a priori significance of $p < .05$. Additionally the Cohen's effect size was calculated to measure magnitude of significance between survey sections and groups. A Modified Angoff Method was incorporated to determine a cutoff score for minimum survey proficiency as assessed by two independent content raters.

Results

Analysis of means indicated that individuals (n = 62) previously enrolled in a college-level nutrition course scored higher (M = 57.49, SD = 13.22) than those (n = 46) who had not completed a nutrition course (M = 51.07, SD = 13.47). Additionally, those who had completed a nutrition course scored higher in dietary recommendations, sources of nutrients, optimal food choices, and diet-disease relationship (M = 7.36, SD = 1.92, M = 40.18, SD = 9.73, M = 4.33, SD = 1.68, M = 5.62, SD = 2.16) than those who did not (M = 6.61, SD = 1.93, M = 35.72, SD = 9.63, M = 3.83, SD = 1.99, M = 4.91, SD = 2.62). Percent of questions answered correctly for students within each section and total survey are presented in Table 1. Cohen's kappa was analyzed to determine if there was agreement among raters in determining a performance standard. An interrater reliability analysis using the kappa statistic was performed to determine consistency among raters. The interrater reliability for raters was found to be significant for dietary recommendations (κ = .621, p = .026), sources of food (κ = .639, $p < .001$), optimal food choices (κ = 714, p = .035), diet-disease relationship (κ = .683, p = .009), and total (κ = .657, $p < .001$). Interrater reliability and the averaged cutoff score are presented in Table 2.

To test the hypotheses that students who had previously taken a college nutrition course (n = 62) and students who had not (n = 46) were associated with statistically significant differences in nutrition knowledge, independent samples t-tests were performed. The assumption of homogeneity of variance was tested and satisfied via Levene's F test for overall score, dietary recommendations, and sources of nutrients ($F(106) = .414$, p = .522; $F(106) = .016$, p = .899; $F(106) = .126$, p = .724) but was not satisfied for the identification of optimal dietary choices and diet-disease relationship ($F(106) = 3.03$, p = .085; $F(106) = 5.19$, p = .025). As seen in Table 3, the independent sample t-tests for total scores, dietary recommendations, and sources of nutrients was associated with a statistically significant effect ($t(106) = 2.487$, p = .014; $t(106) = 2.006$, p = .047; $t(106) = 2.368$, p = .02). Thus, a statistically significant difference in mean nutrition knowledge was observed within the three categories between students who had taken a nutrition course versus those who had not. However, the independent sample t-tests for identification of optimal dietary choices and diet-disease relationship were not associated with a statistically significant effect ($t(86.65) = 1.371$, p = .174; $t(85.41) = 1.546$, p = .126). Additionally, Cohen's effect size value suggested a moderate practical significance for total score and sources of nutrients (d = .46; d = .48) and a low to moderate practical significance for dietary recommendations, diet-disease relationship, and optimal dietary choices (d = .39; d = .31; d = .27) respectively.

Discussion

It is necessary to acknowledge the limitations of the study design and specific methodology utilized. One limitation to the study is the utilization of non-random sampling in the selection of participants for this survey study, which disallows for any inferences to a larger population. Due to this non-randomized sampling, some measure of selection bias is probable regarding individuals who chose to participate versus those who abstained. Additionally, there was no distinction between student tracks, which left researchers unable to determine if there were significant differences between the options. Finally, only utilizing two raters to determine cutoff scores may have inflated the determined values as well as the inherent limitations of the Modified Angoff Method including the subjective nature of determining cutoffs.

The results of this study support the assertion that students who complete a college-level nutrition course score significantly higher on nutrition knowledge surveys than those who have not completed similar course content. This finding builds on previous literature that indicates increased nutrition knowledge scores from professionals whose college coursework required nutrition. Bahl, Hamilton, and Ormesher (1993) reported that allied health students who completed a college-level nutrition course scored significantly higher on a nutrition knowledge survey. Similarly, coaches (Seminara, 2007), athletic trainers (Farthing, Graves, Smith, & Turchi, 1991), physical educators (Conkle & Tishler, 1992), and physical therapists (Sack et al., 2009) demonstrated an increased capacity for nutrition knowledge after similar nutrition education.

Participant scores also support a lack of knowledge and preparation among these individuals in auxiliary professions that would allow for effective and accurate dissemination of nutrition information and the need for further education (Kitchen & Clark, 2009; Ettienne-Gittens et al., 2012; Turner, Knol, & Meyer, 2012). While there was a significant difference between students who had completed a nutrition course versus those who had not, the overall score totals indicate a lack of proficiency in fundamental nutrition knowledge scores as compared to raters' cutoff score values. The only domain within the survey that individuals who completed a nutrition course scored higher than the raters' cutoff was the dietary recommendations portion. In all other sections of the survey, participants scored significantly lower than the projected estimate for minimal proficiency established by the raters. To score well on the survey, it was necessary to not only understand concepts related to optimal nutrition, but also be able to apply them in practical applications that may be common in nutrition education settings. These results among students who had previously completed a nutrition course may be indicative of a curriculum without sufficient focus on the applicatory nature of nutrition.

Future research should seek to further elucidate the relationship between participant factors that may influence nutrition knowledge and may include previous nutrition education and a distinction between various track options within the degree program. Additionally, evaluation regarding the alignment of nutrition course content and pedagogical methods to established competencies such as the California Nutrition Education Standards may further illustrate optimal pathways and processes to maximize student mastery of fundamental nutrition concepts and their application.

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Table 1. Percent answered correctly among students previously enrolled and students never enrolled in a college nutrition course

	Previously Enrolled (n = 62)		Never Enrolled (n = 46)
Knowledge domain (max score)	*Percent Correct*		*Percent Correct*
Dietary recommendations (11)	66.8		60.1
Sources of nutrients (66)	60.8		54.1
Identifying optimal dietary choices (8)	54.0		47.9
Diet-disease relationship (13)	43.5		37.8
Total score (98)	58.7		52.1

Table 2. Interrater agreement for test item difficulty and criterion-reference cutoff score determined by a Modified Angoff's Method

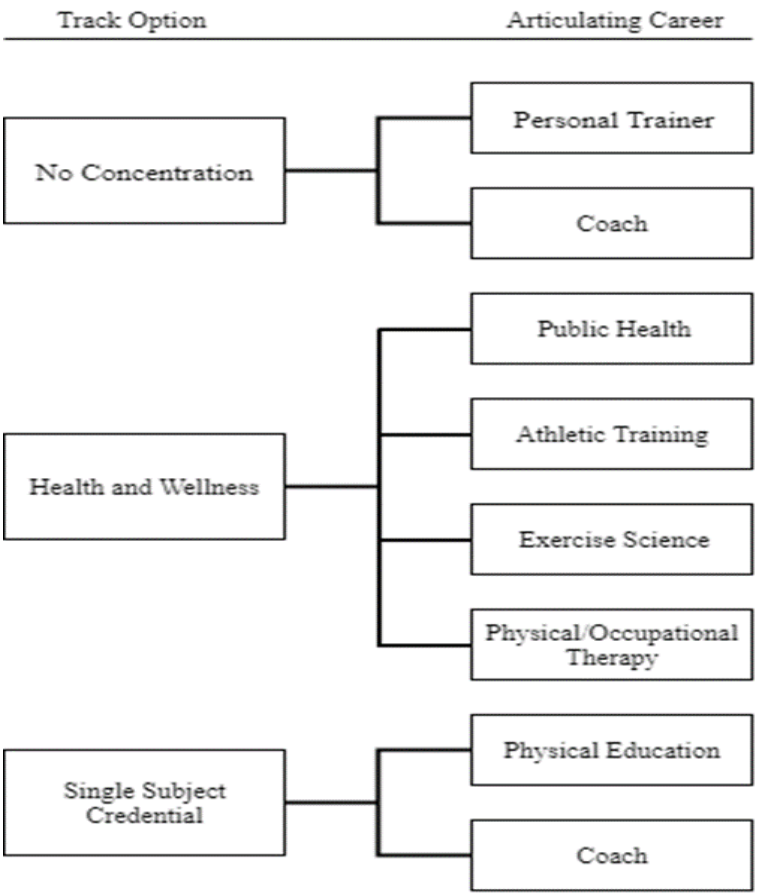
Knowledge section (max score)	*Rater 1*	*Rater 2*	*Inter-Rater Agreement (Reliability)*	*Cutoff*
Dietary recommendations (11)	6	8	.621	7
Sources of nutrients (66)	54	50	.639	52
Identifying optimal dietary choices (8)	6	5	.714	6
Diet-Disease Relationship (13)	8	8	.683	8
Total Score (98)	73	69	.637	71

*Standards of strength of kappa coefficient (Landis and Koch, 1977)
< 0 = poor; .01-.20 = slight agreement; .21-.40 = fair agreement; .41-.60 = moderate agreement; .61-.80 = substantial agreement; .81-1.0 = almost perfect agreement

Table 3. Differences in knowledge scores between students previously enrolled and students never enrolled in a college nutrition course.

	Previously Enrolled (n = 62)		Never Enrolled (n = 46)			
Knowledge section (max score)	*Mean (s.d.)*		*Mean (s.d.)*		*p**	*Cohen's d*
Dietary recommendations (11)	7.35 (1.90)		6.61 (1.93)		.047*	.39
Sources of nutrients (66)	40.16 (9.65)		35.72 (9.63)		.020*	.46
Identifying optimal dietary choices (8)	4.32 (1.67)		3.83 (1.99)		.174	.27
Diet-Disease Relationship (13)	5.65 (2.15)		4.91 (2.62)		.126	.31
Total Score (98)	57.48 (13.11)		51.07 (13.48)		.014*	.48
**p < 0.05*						

Figure 1. Major and track option with articulating career paths



Peer Reviewed Article

Comparisons of Measured Body Composition and Self-Perception of Body Type In Racially and Ethnically Diverse Male and Female College Students

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ABSTRACT

Individual perception of body size varies by gender and ethnicity and some these groups have been found more accepting of overweight body types than others. Groups who positively value body types deemed clinically overweight or obese may be unreceptive to weight management techniques aimed to decrease risk for obesity-related chronic diseases. The present study examined the relationship between perceived body image and measured body composition, across race and gender, in a group of 240 college-aged students. Participants underwent skinfold body composition assessment and completed a questionnaire designed to elicit perceptions of body image and body weight status. One in four females who were in the acceptable range for body fat percentage identified themselves as overweight. Over half of White males (57%), White females (80%), and Black females (50%), who were overweight, perceived themselves to be "about the right weight". Over half of all Asian (56%), Black (50%), and Hispanic (67%) males, in the acceptable range for body fat percentage identified themselves as overweight. These findings indicate a majority of individuals, regardless of gender, race, or ethnicity misperceive their body type and consequently may be unaware of the potentially negative affect on their overall health status.

Keywords: overweight, obese, race, gender, body fat percentage, body image.

Introduction

Obesity is a chronic and costly disorder that burdens individuals and society. Two-thirds of Americans are classified overweight and obese (Flegal, Carroll, Ogden & Curtin, 2010), but less than one in four view their body weight as a serious personal health concern (Oliver & Lee, 2001). While Americans seem to recognize this trend of increasing obesity in their fellow citizens, they have been less inclined to recognize this condition in themselves. In a national telephone survey conducted by the Pew Research Center (2006), nine out of 10 American adults surveyed said that their fellow Americans were overweight, however, when asked about themselves, only 40% of respondents identified themselves as overweight. However, disparities exist in the prevalence of obesity among gender, race, and ethnic groups within the U.S. (Ogden, Carroll, McDowell, & Flegal, 2007; USDHHS, 2001; Yancey, et al., 2004). The precise mechanism responsible for these observed racial, cultural, and gender differences are unclear.

Discordance between one's body image and actual body composition, based upon established biomedical standards, may create a barrier to behavior change. If differences exist between racial or ethnic groups regarding perceptions and beliefs

related to body image, body size, and weight status, this may explain, in part, the higher prevalence of overweight and obesity among certain groups.

If particular groups positively value a body type, or erroneously classify body weight that is deemed clinically overweight or obese, it might be difficult to promote effective approaches towards weight management that would decrease the risk for development of obesity-related chronic diseases.

The purpose of the present study was to compare perceived body type, as assessed by a written questionnaire and body composition, as determined by skinfold measurement, in a group of racially and ethnically diverse male and female college students.

Methods

This cross-sectional design study included 240 male and female California State University students aged 18 – 25 years, recruited according to demographic characteristics, with an equal number of participants (n=30) in each gender and ethnic category (White, Black, Hispanic, Asian).

After obtaining informed written consent, each participant completed a self-administered written figure-rating questionnaire designed to elicit relevant demographic data (i.e., age, gender, race/ethnicity) and to determine perceptions of their own body type. All participants were asked to answer either "underweight," "about the right weight," "overweight," or "obese," or when responding to the questions, "When you look at yourself, do you think that you look _____?" and "Do you think that you are _____?" Individuals who identified their perceived body type differently from their classified body weight, based on skinfold measurements, were considered to have weight misperception. This methodology is consistent with that used by Dorsey, Eberhardt, and Ogden (2009).

Upon completion of the questionnaire, body composition measurement was performed and calculated using a seven-site skinfold measurement technique in accordance with American College of Sports Medicine (ACSM) guidelines (Thompson, Gordon, & Pescatello, 2010). Each participant was categorized as being lean, acceptable, overweight, or obese based on criterion scores for percent body fat (Earle & Baechle, 2004).

Data summary of this cross-sectional study design includes comparative descriptive statistics, frequencies, and relative frequencies. A Pearson's Chi-square test was conducted to determine if there were a significant differences between perceived body types across body composition categories.

Results

Nearly 22% of males and 38% of female participants were categorized as overweight or obese, with 14 females and one male categorized as obese. A far greater percentage of males (48%) compared to females (28%) fell into the lean category. Overweight and obese female participants (59%) were more likely than overweight and obese men (27%) to underestimate their weight status. Overall, only 36% of overweight and obese women correctly identified their weight category, whereas nearly 7 of 10 overweight and obese male participants accurately identified themselves as overweight or obese.

Compared to White and Black females in this study, Asian and Hispanic females categorized as overweight or obese (n = 45) were more likely to perceive themselves as so. Among overweight and obese females, 79% of Asian and 83% of Hispanic females accurately identified their own body composition category compared to 58% of Black females and 44% of White females. The remaining 57% of White, 42% of Black, 21% of Asian, and 17% of Hispanic overweight or obese females misperceived themselves as about the right weight. No females who were overweight or obese perceived their body type to be lean. Of the 14 obese females, only one identified themselves as obese, ten identified themselves as overweight, and three (two Black, one Asian) perceived themselves as about the right weight. At the other end of the continuum, slightly more than one in four females in the lean or acceptable range, regardless of ethnicity, incorrectly perceived themselves as overweight or obese, with the rate of misperception being slightly higher, nearly 33%, with Asian females. Only two females thought that they were underweight and both fell into the lean category.

Males categorized as overweight or obese were much more accurate in their perceptions of their own body type. All Asian and Black males categorized as overweight or obese saw themselves as such. Six of the seven overweight Hispanic males accurately perceived their overweight status. One overweight Hispanic male incorrectly identified himself as being about the right weight. Overweight or obese White males were the least accurate in their body type self-perceptions, with only 43% accurately identifying their weight category. The remaining 57% perceived themselves as about the right weight. There was only one male participant (White) categorized as obese, yet he perceived himself as overweight. In males categorized as lean or acceptable, rates of misperception of body type as overweight or obese was Asian (24%), Hispanic (26%), Black (16%), and White (18%). Within the group of males categorized as acceptable, over half of Asians (56%), Blacks (50%), and Hispanics (67%) identified themselves as overweight, which is in stark contrast to females. Ten males identified themselves as underweight, with 90% of them categorized as lean and one as acceptable.

Table 1 summarizes the data for the percentages of "overweight/obese" participants who incorrectly identified their body status as "about the right weight".

Data analysis indicated that lean and obese women and lean men were significantly more likely to misperceive their body type than all other groups. Further analysis indicated that two-thirds of males and females perceived their body type to be acceptable/about right. Analysis of the data using Chi-square testing revealed statistical significance of $p = .003$ for females and $p = .000$ for males.

Discussion and Conclusion

The prevalent research paradigm related to the misperception of body type has focused on individuals of acceptable weight who perceive themselves to be overweight. (Dorsey, Eberhardt & Ogden, 2009; Kuchler & Variyam, 2003) This erroneous perception of overweight can lead to negative behaviors such as unnecessary excessive exercise, unnecessary dieting, and/or disordered eating. This study attempted to examine a contrasting body type perception from the typical body dysmorphia research paradigm. The authors of this study sought to identify individuals who perceived their body type as acceptable in weight, when in fact, these individuals were overweight or obese. This type of misperception may have the consequence of failing to provide the stimulus that will provoke and individual to take action leading to a healthy weight status. Perhaps the most revealing finding from the present study was that a substantial number of individuals misperceive their body type and appear to be unaware of their own body status and the potential negative health consequences associated with this misperception.

Some of the individuals in the current study supported a traditional view of body type misperception, in that, roughly one in five males and one in four females misperceived themselves to be more overweight/obese when they were acceptable weight. However, in this study, roughly one in five males and one in two females misperceived themselves to be leaner than they were. This misperception was most prevalent in White males and females and Black females (Tables 2 and 3).

Table 2: Frequencies of perceived body type within categories of measured body composition in females

Previous studies which included White, Black, and Hispanic-American racial and ethnic groups have reported that perceptions of body composition may be greatly influenced by ethnic or gender-based cultural attitudes, values, and beliefs (Chang & Christakis, 2001; Dorsey, et al., 2009; Kuchler & Variyam, 2003; Patel & Gray, 2001). A unique aspect of the present study was that Asian-Americans were also included. The reported misperceptions of body composition, if due to culturally influenced attitudes and beliefs, may negatively impact individual health and the delivery of efficacious preventative healthcare. Therefore, it would be valuable for all those involved with the management of weight-related issues to be aware of these possible ethnic and/or gender based misperceptions. Pending the results of further study into this area, it is recommended that individuals be independently assessed for self-perception of body type.

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Table 1: Percentage of "overweight/obese" participants who incorrectly identified their body status as "about the right weight"				
	White	Black	Hispanic	Asian
Male	57	0	14	0
Female	56	42	17	21

Table 2: Frequencies of perceived body type within categories of measured body composition in females					
	Measured Body Composition Category				
	Lean	Acceptable	Overweight	Obese	Total
Perceived Body Type					
Underweight	2	0	0	0	2
About right/Acceptable	25	27	13	3	68
Overweight	5	13	15	10	43
Obese	0	1	2	1	4

Table 3: Frequencies of perceived body type within categories of measured body composition in males					
	Measured Body Composition Category				
	Lean	Acceptable	Overweight	Obese	Total
Perceived Body Type					
Underweight	9	1	0	0	10
About right/Acceptable	43	18	6	0	67
Overweight	3	15	18	1	37
Obese	0	0	1	0	1

Peer Reviewed Article

Supply and Demand Data for California Physical Education Teachers

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ABSTRACT

The labor market represents a core issue that professions should strive to understand. In California, the labor market is particularly relevant for those in education as there is discussion around a teacher shortage. Couple that with a profession that has had to endure teacher layoffs stemming from underlying economic issues, such as school district concerns about budget deficits, it highlights the overall complexity of the labor market. For members of the physical education profession, dealing with the dynamical nature of the labor market has been an unfortunate reality. From physical education teachers to physical education teacher education programs, key stakeholders should know the fundamentals regarding the labor market. The purpose of this article is to summarize recent supply and demand data for California physical education teachers. Beyond describing supply and demand data, implications will be discussed regarding how labor market trends impact members of the profession.

Keywords: physical education, supply and demand data.

Introduction

As of 2016, California is home to the world's sixth-largest economy (United States Bureau of Economic Analysis, 2006). In spite of the overall health of the economy, the education sector has experienced its share of setbacks. For physical education, issues, such as teacher layoffs, can be traced back to 2008 and as recently as 2017 (Warth, 2017). Ironically, cuts such as these are occurring in a climate where there is discussion about a statewide teacher shortage (Carver-Thoms & Darling-Hammond, 2017). In what appears to be dueling forces, teacher layoffs and teacher shortages, it begs the question: What is the labor market for physical education teachers in California? More specifically, what is the supply and demand for physical education teachers?

Why is supply and demand a valuable reference point for the physical education profession? Examining supply and demand data provides insight on a variety of factors (Hamermesh, 1986). Data can serve as an indicator on the overall health of the job market. Labor economists also laud the value of supply and demand data as it provides insight on the equilibrium of a market (Gale,1955). For example, to achieve true equilibrium in the physical education labor market, the supply of physical education teachers would match the demand; meaning, no job would go unfilled or candidate would be left jobless. In reality, finding such balance in the labor market can be difficult to achieve.

In the case of teaching, individuals can pursue different pathways to secure a credential (e.g., teacher education, out-of-state, internship program). Year-to-year this can make it difficult to know how many teachers will enter the labor market. Likewise, movement out of the profession can be challenging to forecast as well. Recently, it has become more commonplace for some people to delay retirement and remain in the workforce for

longer periods of time (Dong, Wang, Ringen & Sokas, 2017). The dynamical nature of the labor market further establishes the need to understand specifics of the labor market for physical education teachers. In the corporate world, the term "headwinds" describe factors that prevent growth, and "tailwinds" describe factors that promote growth. For physical education, these terms are also relevant. Case in point, a recent headwind has been the decline and elimination of some physical education teacher education (PETE) programs (Blankenship & Templin, 2016). Conversely, the research and knowledge base supporting physical education continues to grow stronger and stronger. One notable tailwind is evidence affirming the relationship between physical activity and cognitive functioning (Penedo & Dahn, 2005). For physical education professionals it is important to champion the tailwinds and prepare for the headwinds. The purpose of this article is to describe the supply and demand California physical education teachers and its implications for the profession.

Methods

The article is based on a secondary analysis of an existing dataset. Secondary analysis is a tool to explore additional research questions that are generated from data (Heaton, 2008). Two datasets were examined to gain insight on the supply and demand of California physical education teachers. The California Commission on Teacher Credentialing maintains supply data (California Commission, 2016). Demand data was secured through the publicly accessible California Department of Education's database (California Department of Education, 2016). For this article, supply and demand data were retrieved from the years 2011-2016; in addition, the database provides a forecast for demand through 2017-2018. At the time of writing this article, the supply and demand data for 2017-2018 was not available yet. To analyze data, descriptive statistics were used to compare changes in supply and demand over time.

Supply and Demand Data

The supply data consists of individuals classified as possessing physical education single-subject teaching credentials. The providers of the single-subject credential were characterized as the following: teacher education programs, district interns, individuals prepared out of state, and direct applications. On the demand side, it is important to note two things. First, the California Department of Education reports an estimated number of teacher hires. Secondly, the California Department of Education's database for teacher hires lists the subject area as physical education, health, and dance. While not perfect, the database does provide insight on how many teachers have been hired in physical education and closely related content areas. Only for 2015-2016, is it possible to tease out how many teachers were hired explicitly for physical education positions. What follows is a chronological breakdown of supply and demand data, beginning with the 2011-2012 academic year. See Table 1 for a summary of all data.

For the 2011-2012 academic year, there were a total of 672 newly credentialed physical education teachers. The largest proportion of which received credentials from teacher education programs (n = 493). Second to this pathway were people who were prepared to teach physical education out of state (n = 108). On the demand side, it was reported that there were a total of 355 hires for physical education/health/dance. Los Angeles County hired the most teachers (n = 99), while Contra Costa filled the second most positions (n = 41).

In total, there were 573 newly credentialed physical education teachers for the 2012-2013 year. Representing a 14.7% decrease from the prior year. Teacher education programs again constituted the largest producer of physical education teachers (n = 418). Out of state prepared teachers (n = 82) again represented the second largest producer. Demand data showed that there were a total of 540 physical education/health/dance teachers hired. A 52% increase from the prior hiring cycle. Los Angeles County was again the leader in hires (n = 187), with Alameda County coming in second (n = 48).

The supply of credentialed physical education teachers for 2013-2014 totaled 552. A 3.7% decrease in the amount of credentialed physical education teachers from the prior academic year. Similar to other years the two largest producers of credentialed teachers were teacher education programs (n = 373) and out of state teachers (n = 179). Demand for physical education teachers also decreased from the previous year, a total of 510 physical education/health/dance teachers were hired. Los Angeles County again assumed the top spot by hiring a total of 135 teachers. Alameda County hired the second most teachers (n = 80).

The 2014-2015 academic year saw an increase in the number of newly credentialed physical education teachers (N = 611), representing a 10.7% jump from the previous year. Teacher education programs led the way by producing 415 credentialed physical education teachers, which represented an 11% increase. Out of state teachers also increased from the prior year to 131. The increase trend extended to demand data as well. In total, the state hired 625 physical education/health/dance teachers. A 23% increase in the number of teachers who received teaching positions. Los Angeles County (n = 149) and Alameda County (n = 87) were again the leaders for new hires. Santa Clara County and San Diego County also hired close to 50 teachers.

The supply of physical education teachers for the 2015-2016 academic year was 611. In-state PETE programs produced 415, while 159 were individuals were from out of state. Both numbers were increases from the previous year. Of note, a category that saw a steady increase in the number of credentialed teachers is termed direct applications by the California Commission on Teacher Credentialing. Specifically, direct applications increased from 52 credentialed physical education teachers in 2011 to 76 in 2015, equaling a 46% increase. As previously mentioned, 2015-2016 is the only year where it was possible to separate physical education from health and dance. In total, there were 575 people hired to fill physical education positions in the state. Los Angeles County hired 120 physical education teachers. Alameda County hired 81 teachers and San Diego County hired 60 teachers.

The California Department of Education provides projections for teacher hires. For the 2016-2017 hiring cycle, it was projected that physical education/health/dance would hire a total of 834 teachers. Going into 2017-2018, the anticipated number of hires increases to 913 teachers. Dating back to the number of hires in 2011 (n = 355), the 913 projected hires represent a 157% increase.

Looking at the supply data as a whole. A clear trend emerges, in-state PETE programs are the biggest producers of physical education teachers. Between 2011 and 2015, PETE programs produced a total of 2,149 credentialed physical education teachers. At 2,149, PETE programs have produced 69% of the credentialed physical education teachers from 2011-2015. On average, PETE programs yielded 430 physical education teachers each year during the time span. In 2011, PETE programs graduated 493 teachers, with lowest being 373 during 2013. Following 2013 the number of credentialed teachers has steadily increased to 450 in 2015.

The number of people pursuing alternative pathways to a teaching credential has also increased. Notably, since 2011 a total 588 out of state physical education teachers have been issued a teaching credential. At 588, out of state physical education teachers represent close to 19% of the credentialed teachers between 2011-2015. The single highest year was 2015, with 159 out of state teachers moving into the state. Individuals who submitted direct applications represent the third highest proportion of credentialed teachers. In total, 320 direct applicants were issued credentials between 2011 and 2015, or about 10% of the total.

The demand side can also be characterized as possessing two trends. First, the demand for physical education teachers has increased from 2011 (N = 355). Underscoring the positive trend is the 52% jump going into the 2012 hiring cycle (N = 540). The promising trend is further substantiated as the

California Department of Education projects hires to increase from 834 in 2016-2017 to 913 in 2017-2018.

The second demand trend highlights that densely populated counties and school districts hire a majority of physical education teachers (see Figure 1). For example, in 2015-2016 Los Angeles County hired 120 physical education teachers, representing 21% of the total teachers hired. Factoring in Alameda Country (14%) and San Diego County (10%), these counties were responsible for hiring 45% (i.e., 261 out of 575) of all physical education teachers hired in the state of California for 2015-2016. Similar trends were present from 2011-2015; meaning, year-to-year densely populated counties are where most of the jobs are available (see Figure 1). For perspective, Los Angeles County has hired 690 physical education/health/dance teachers between 2011-2015, or about 26% of the total (N = 2,605). It is again important to note that the demand data from 2011 – 2014 aggregates physical education/health/dance teacher hires. Hopefully, going forward this is a matter that the California Department of Education rectifies.

The total supply of physical education teachers between 2011-2015 was 3,104. Comparatively, the demand for physical education teachers during that same time frame was 2,605. Consequently, there was a surplus of 499 credentialed physical education teachers. On the surface, the surplus issue raises some questions and concerns. It is important to note that PETE programs produced 2,149 physical education teachers. From this perspective, the traditional pathway to teaching, the in-state PETE program, would have not produced enough teachers. Specifically, in-state PETE programs would have been at a deficit of 456. The implication being that California appears to be reliant on alternative pathways to fill teacher vacancies (e.g., out of state, internship programs, direct applications). Unfortunately, it appears that when all the different pathways, both traditional and non-traditional, combine it has created a surplus of physical education teachers in the job market.

Conclusion

In this article, we attempted to examine trends in the California labor market for physical education teachers. Supply and demand data contributes four valuable lessons to concerned stakeholders. First, on average the demand for physical education teachers is increasing. Notably, the demand for physical education/health/dance teachers has steadily risen from 2011 to 2015, further strengthened when factoring in the projections for the coming years. All together there has been a 19% increase in the demand for teachers in these content areas. Second, demand for physical education teachers can largely be attributed to densely populated counties and school districts. Third, the in-state PETE program is still the lifeline for the physical education profession, as it is by far the biggest producer of credentialed teachers. Fourth, the supply of credentialed physical education teachers exceeding the demand has been an issue. For example, the height of the surplus occurred during the 2011-2012 academic year. During this year the supply (N = 672) exceeded the demand (N = 355) by 293. Collectively, the key takeaways dovetail well with headwinds and tailwinds analogy. The physical education profession has certainly encountered dueling forces within the labor market. Examination of supply and demand data offers important lessons for key stakeholders. One lesson is that PETE programs must prepare graduates for the reality of the labor market. Most jobs are going to be situated in densely populated counties and school districts. Exposing pre-service teachers to these environments during the preparation years may be key. A second lesson, based on data from the California Department of Education, demand for the profession appears to be increasing in coming years. Knowledge of this projection may be a useful advocacy tool for PETE programs to promote to potential students.

Supply and demand trends also create more questions. One prominent question deals with

movement within the labor market. During years where there is a surplus, what happens to those freshly minted credentialed physical education teachers who do not get a job? Clearly, there is a range of possibilities for these people to pursue, from substitute teaching to graduate school. We believe insight on these individuals offers the potential to move the profession forward. Specifically, physical education can ill afford to allow promising graduates to leave the profession in the event they are unable to secure a position upon graduation. A closely related question deals with who is getting hired for vacant physical education positions? Are new positions being filled by substitute teachers, in state PETE program graduates, out of state, or all of the above? A deeper understanding on the background characteristics of new hires offers useful knowledge for key stakeholders, particularly the PETE program whose job it is to train future California educators. Predictably, supply and demand data revealed a combination of headwinds and tailwinds in the labor market. The nature of the labor market makes it challenging to fully understand and predict. Underlying economics, people within the profession, changing politics, and other matters show that there are a lot of moving parts. We believe to approach an understanding of the labor market rests with data. Most importantly, a key message of the article is that data provides knowledge, which by extension can inform action. For those key stakeholders, the PETE professors, physical education teachers, and school administrators, there lies great potential in possessing a clear understanding of the labor market. The more we know about the labor market, the more decisions and policies can be informed.

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Table 1

Summary of Supply and Demand Data for Physical Education Teachers

	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	Total
Supply	672	573	552	611	696	3,104
Demand	355	540	510	625	575	2,605

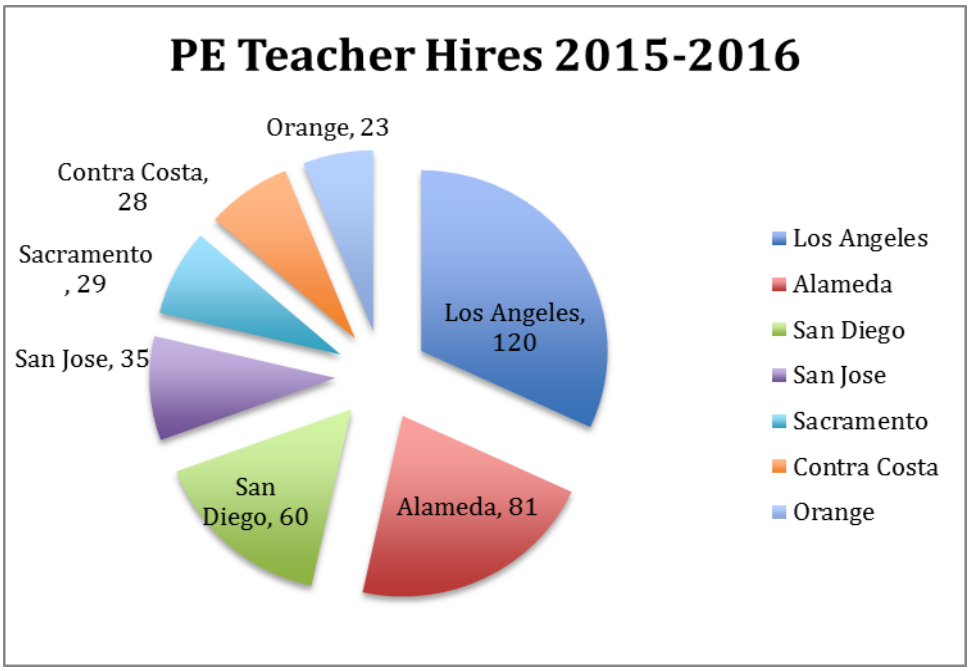

Figure 1. Summary of demand data for physical education teachers in 2015-2016.

Call For Papers

The California Association for Health, Physical Education, Recreation, and Dance issues this call for papers anticipated to appear in the Fall 2019 and Spring 2020 editions of the CAHPERD e-Journal. The e-Journal contains two types of articles: (a) practical manuscripts related to teaching, professional practice or performance, (b) research articles in the HPERD disciplines. All submissions will be subject to a blind peer review process. Authors who are professionally engaged in the study of HPERD and related fields, including professors, teachers, and others, are encouraged to submit articles for review and potential publication. Authors need not be professional writers. Graduate students in the HPERD disciplines are also encouraged to submit. The editors will give priority consideration to those articles that relate directly to HPERD issues confronting California professionals. This includes articles that provide expert teaching strategies. Authors may not submit the same article to this e-Journal and other publications for simultaneous review. Previously published content should not be submitted.

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Manuscripts should not exceed 2500 words (not including references or graphics). Authors are expected to follow APA formatting. The order of information included in the manuscript should be as follows: (1) Cover letter, (2) Title Page, (3) Title page with author(s) and affiliation information, (4) Abstract, (5) Text, (6) References, (7) Tables, (8) Figures, and (9) Acknowledgements, if appropriate.

Manuscripts for the upcoming issues may be submitted electronically to Paul Stuhr at pstuhr@csusm.edu

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