Arkansas Journal

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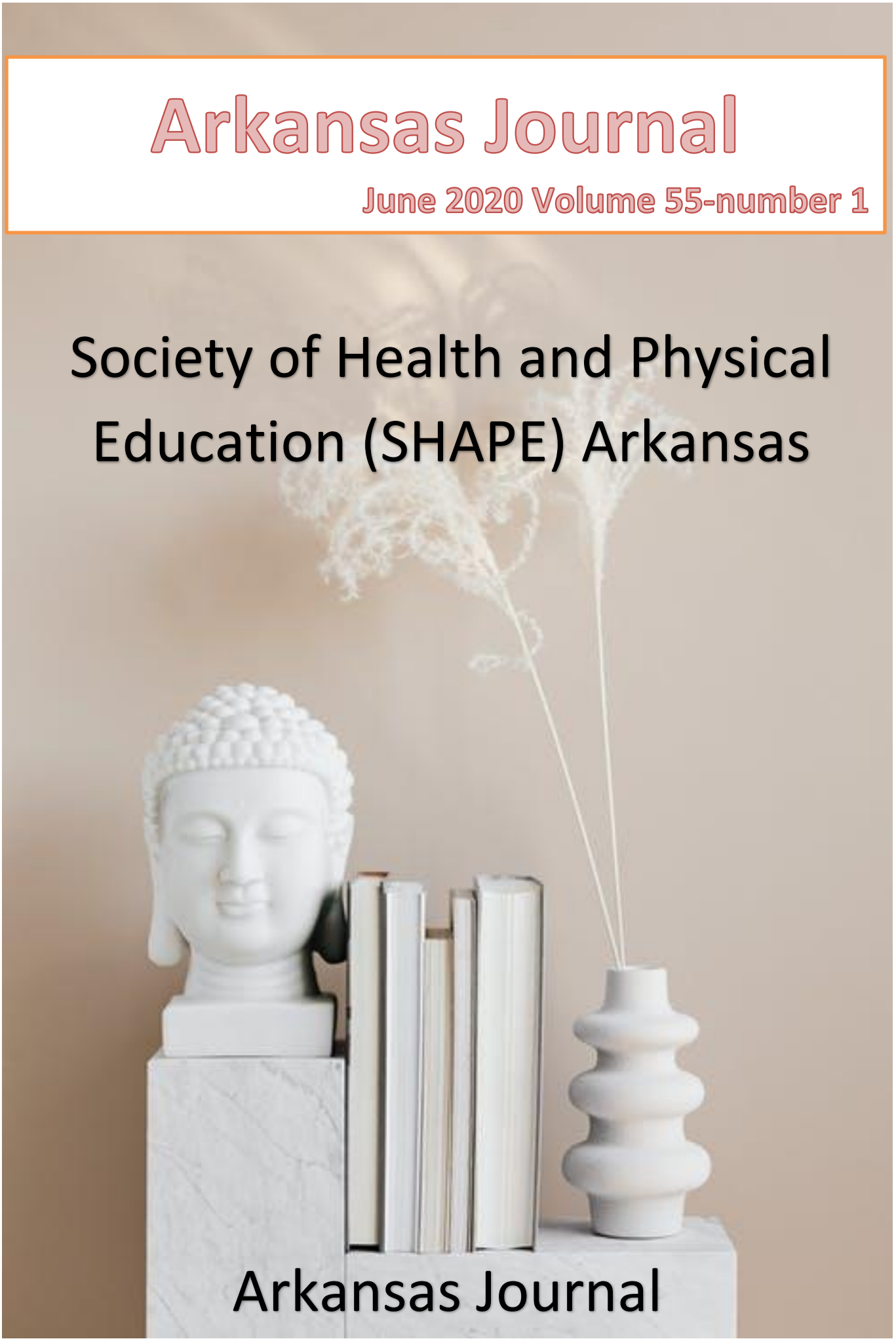
# Society of Health and Physical Education (SHAPE) Arkansas



Arkansas Journal

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## News and Information



**Research Articles**

**Message from SHAPE ARKANSAS President Sean Engle**

Hello SHAPE ARKANSAS Members,
Thank you for allowing me to serve as your SHAPE ARKANSAS president through the fall of 2020. We have many exciting things happening this year and I would like to bring them to your attention!

• Be on the lookout for our online database! We will begin to develop an online database that will include professional videos and material for our members to have access to.
• Heaven Winn is our new Social Media Director! Please follow us on Twitter and Facebook. She continuously adds new material for our members and has been doing an amazing job!
• The summer workshop is still on! Due to Covid-19, it might become an online workshop but it is still happening. More information to come!
• Our fall convention will be hosted by Arkansas Tech this year.
• We are continuously adding new members to our organizations that have great passion for our field.

"***Achieving Success Through Movement***" is this year's theme. This year's theme has two very important meanings. To our students, it means being active leads to being successful. By moving and staying active, we can keep our bodies healthy and have a positive quality of life. To our members, it means our organization needs to keep moving forward. We have accomplished some great achievements but that does not mean we stop moving forward. We must always look to improve and grow our organization. I am excited about this year and the new opportunities to come. Thank you again for allowing me to represent you through the fall of 2020.

Sincerely, President Sean Engle

Letter from the Executive Director Charles Hervey:

First, let me thank the board and members who worked diligently to review and publish our SHAPE Arkansas 2019-2020 Journal, a round of applause goes to those who submitted their research. I would also like to thank our 2019 State convention main speaker, Mike Martinez and everyone who contributed to making this event successful. Your hard work and time is greatly appreciated.

We finalized our 2019 year by completing our professional development training, made a few changes to the board and we were off to great start then Covid-19 hit. So now, we are constantly prepping as we try to find some complacency in our temporary "new normal". In this phase, our focus is determining how to deliver content effectively for Health education, Physical education, Dance education, Recreation Coaching, and Exercise science… How do we ensure the same level of student accountability and how can we ensure compliance during training with both professional and nonprofessional members in a virtual environment? We must commit to the challenge by continuing to execute and establish goals that will help us continue to evolve as we begin to understand what we simply do not know such as:

- Experience with virtual online learning tools
- Inequalities in access needed for online provisioning at the home
    - Internet access
    - Designated space
    - PC or laptop
- Self- paced discipline
- Conducive learning environments
- Parental or household support
- Mental preparedness to manage this change

We are working with **Open/PE** to create a summer workshop in June that will help with some of these issues and will use that platform to build and establish best practices moving forward.

The SHAPE website and Social media will be our biggest form of communication so please stay tuned and plugged in. We are asking our board and members to be active. I.E; "likes", comments and by adding appropriate content to our Facebook, Instagram and YouTube sites. You can also login to **Open/PE** and **Catch-Go Dough** for in-service training on digital media education.

Lastly**, Catch-Go Dough** has collaborated with SHAPE Arkansas to assist with fundraising efforts for your school and the 2020 state convention. Please go to www.shapearkansas.com/ donation/fundraiser page. You can get information on establishing your schools' personal fundraising event. Use the, **Catch-Go Dough** tool kit and watch the tutorial video to help you launch a successful fundraising campaign.

The 2020 State Convention is tentatively scheduled for November 7 & 8th 2020, at Arkansas Tech University in Russellville. Please check the website for more information. I am looking forward to seeing you all soon. Have a great one and be safe!

**Society Health and Physical Education - SHAPE Arkansas**

**Executive Director & Web master** – **Charles Hervey** serves the BOD
chervey@uca.edu 501-450-5714

**Board of Directors serve 1 year**

**President Sean Engle** term ends 2020 sengel@uce.edu
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**Past President Leah Queen** term ends 2021 perock78@gmail.com
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**Arkansas Journal – Dr. Bennie Prince**
**Teacher of the Year Awards (TOY) Dr. Bennie Prince**
**Program Coordinator – Leah Queen** perock78@gmail.com
**Exhibitor Coordinator – Lindsey Beaton** lbeaton@dewittdragons.net

**District Senators serve 2 years**

**District 1** – **Angie Smith-Nix** terms ends 2020
ansmith@uark.edu
**District 2** – **Jonathan Doss** term ends 2020
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**District 3 - Heaven Winn** term ends 2022
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**District 4 - Mitch Mathies** term ends 2022
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**District 5** –**Lewis Kanyiba** term ends 2021
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**District 6** –**Leonard Williams's** term ends 2021
williamsle@uapd.edu

**Future Professionals – serve 1 year**

**Harding University term ends 2020**
Southern Arkansas University Magnolia 2021
University of Arkansas Pine Bluff 2022
Arkansas Tech University 2023
University of Central Arkansas 2024
Arkansas State University 2025
University of Arkansas at Little Rock 2026
Henderson State University term ends 2027

SHAPE Arkansas Social Media links

Tweeter:@ArkAHPERD
https://twitter.com/arkahperd?lang=en

Facebook:Ark Ahperd
https://www.facebook.com/ark.ahperd.3

Linkedin: Ark (ArkAHPERD) AHPERD

Google+:
https://plus.google.com/+Arkahperd

Youtube: ArkAHPERD
https://www.youtube.com/user/ArkAHPERD/featured?disable_polymer=1

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Website: www.arkahperd.com

# Research

*The Relationship Between Anterior Pelvic Tilt and Hamstring-Quadriceps Strength Ratio*

By Amanda Wheeler Gryffin, Arkansas State University, Katherine Shelton, Arkansas State University and Dennis Perkey University of Nebraska Lincoln

Hamstring injuries are common in those who participate in lower extremity intensive sports such as football, soccer, and track and field. On average, these injuries can lead to significant time lost from participation ranging from 17-90 days (Brooks, Fuller, Kemp, & Reddin, 2006; Sherry & Best, 2003; Woods et al., 2004). Hamstring strains also have a high incidence of reoccurrence with varying rates dependent upon time since injury (Engebretsen, Myklebust, Holme, Engebretsen, & Bahr, 2010; Malliaropoulos, Isinkaye, Tsitas, & Maffulli, 2011; Verrall, Slavotinek, Barnes, Fon, & Spriggins, 2001; Woods et al., 2004). As a result, healthcare professionals are often charged with addressing prevention and rehabilitation programs relating to hamstring injuries.

Healthcare professionals must consider both intrinsic and extrinsic risk factors (IRF and ERF, respectively) for hamstring injury. While IRFs such as age, ethnicity, and previous injury cannot be modified, ERFs such as strength, flexibility, and fatigue can often be altered to avoid new and reoccurring hamstring injuries. Pre-participation exams and testing often include evaluation of ERFs in an effort to identify a need for a targeted strength and conditioning program or rehabilitation program.

These assessments often include isokinetic strength testing of the hamstrings and quadriceps muscle groups. Clinicians use the strength measures to detect deficiencies in either of these muscle groups as muscle imbalances have often been linked to hamstring strains (Burkett, 1970; Croisier, 2004). Additionally, the hamstring-quadriceps (H:Q) strength ratios at the knee and hip may be assessed by dividing the strength score of the hamstrings by the strength score of the quadriceps. Hamstring-quadriceps strength ratios are reported to range from 0.43-0.90 with a commonly acceptable H:Q ratio for injury prevention of 0.60 (Goslin & Charteris, 1979; Heiser, Weber, Sullivan, Clare, & Jacobs, 1984;

Nosse, 1982). Research demonstrates strength imbalances at preseason assessment correlate to a higher incidence of hamstring injury (Croisier, Ganteaume, Binet, Genty, & Ferret, 2008; Lee, Mok, Chan, Yung, & Chan, 2018).

Flexibility may also be evaluated at pre-participation examinations through goniometric readings or sit-and reach tests. Flexibility programs are important as flexibility may play a vital role in the strength capacity of muscle groups as well as predisposition to injury. The hamstrings and quadriceps muscle groups are often targets of flexibility measures when assessing potential for hamstring injury. Many authors suspect a deficit in flexibility may be a large contributor to hamstring strains (Bradley & Portas, 2007; McHugh et al., 1999; Witvrouw, Danneels, Asselman, Have, & Cambier, 2003).

Flexibility of the quadriceps and hamstring muscle groups also plays a vital role in posture. For example, the angle of pelvic tilt is affected by the muscle tension in both the hamstrings and quadriceps groups. Given that this angle may increase the tension in the hamstring or quadriceps, a change in the force output and firing rate of either the hamstrings or quadriceps group, respectively, may be inferred. Therefore, this study attempts to identify the relationship between the hamstring-quadriceps ratio at the knee and hip and anterior pelvic tilt.

## METHOD

### Design

The effect of the independent variable of anterior pelvic tilt (APT) was examined in relation to two dependent variables. The first variable was hamstring-quadriceps strength ratio at the knee (H:Qk), and the second variable was hamstring-quadriceps strength ratio at the hip (H:Qh).

### Participants

Two males (19.5 ± 2.1 years, 176.53 ± 0 cm, 74 ± 5.7 kg) and eight females (20.3 ± 1.2 years, 169.4 ± 5.8 cm, 64 ± 7.2 kg) from a NCAA Division I track and field sprinting squad volunteered to participate in this study. The Institutional Review Board approved the study, and all participants signed informed consent and provided health history questionnaire documents prior to data collection.

The health history questionnaire included screening information relating to musculoskeletal injury to the lower extremity and low back over the last 12 months. Potential participants were disqualified if a report was made of a hamstring injury less than six months old or of a surgery to the lower extremity or lower back within the preceding twelve months. These criteria were chosen to eliminate any extraneous data points that may occur due to a decrease in lower extremity strength as a result of the injuries sustained. It was expected that any hamstring injury older than 6 months would have been appropriately rehabilitated to full function.

Procedures

After the participants signed the informed consent document and were cleared for participation in the study, participants were assigned an evaluation time to meet with the athletic trainer. They were also instructed to wear clothing to allow for APT assessment and Cybex testing.

Testing Protocol

APT Testing - Each participant was asked to stand on a level floor with the anterior thigh against a treatment table while looking at a fixed point on the wall in front of them to decrease the likelihood of extraneous movements. The left and right anterior superior iliac spine (ASIS) and posterior superior iliac spine (PSIS) were palpated and marked with a permanent marker. The PALM-o-meter® (Performance Attainment Associates, St. Paul, MN) calipers were placed on the ipsilateral ASIS and PSIS and the measurement was recorded in degrees as an average of three readings. These measures were classified as either positive or negative with positive indicating anterior pelvic tilt and negative indicating posterior pelvic tilt. The process was repeated on the contralateral side.

Isokinetic Testing - Once the static assessment was complete, each participant rode a stationary bike for five minutes followed by self-guided static stretching as a warm-up prior to isokinetic testing. Day one of isokinetic testing consisted of familiarizing participants to the equipment and procedures for concentric testing of the hamstrings and quadriceps at the knee. Familiarization included allowing five practice repetitions at each speed tested (60, 120, and 240 $deg*sec^{-1}$). The standard protocol by HUMAC

(Computer Sports Medicine, Inc., 2003) for concentrically testing the quadriceps and hamstrings at the knee was then completed. Participants performed one set of five maximal knee flexion and extension repetitions at each speed with a one-minute rest break between speeds.

Day two of isokinetic testing consisted of the same protocol for warm-up followed by the standard protocol by HUMAC (CSMI, 2003) for concentrically testing the quadriceps and hamstrings at the hip bilaterally. Speed adjustments (60, 120, and 150 deg*$sec^{-1}$) were made for the hip measures according to the standard protocol.

Data Analysis

Pearson correlations were run using PASW Statistics 18.0 (SPSS, Chicago, IL, USA). Significance was considered to be at or greater than a 95% confidence level ($p \leq .05$).

## RESULTS

No significant correlation ($p > .05$) was found between APT and H:Qk for both right and left measures. Additionally, no significant correlation ($p > .05$) was determined between APT and H:Qh for both right and left measures. To determine the amount of APT accounted for by the hamstring-quadriceps strength ratio, coefficients of

determination ($R^2$) were calculated for each speed in each condition (Table 1).

Table 1. Coefficients of Determination for Measures of Anterior Pelvic Tilt and Hamstring to Quadriceps Ratio at Varying Speeds

| | Knee | | | Hip | | |
|---|---|---|---|---|---|---|
| Measure | 60°*$sec^{-1}$ | 120°*$sec^{-1}$ | 240°*$sec^{-1}$ | 60°*$sec^{-1}$ | 120°*$sec^{-1}$ | 240°*$sec^{-1}$ |
| Right | .141 | .080 | .006 | .089 | .003 | .007 |
| Left | .141 | .033 | .010 | .101 | .001 | .005 |

## DISCUSSION

The primary focus of this study was to assess the correlation between APT and H:Qk and H:Qh. Neither APT and H:Qk or APT and H:Qh demonstrate a significant relationship. Although, no significant correlation was demonstrated, it was noted that the relationship between APT and H:Q for both knee and hip move toward significance as testing speed is decreased.

$R^2$ values for APT and H:Qk and H:Qh correlations are low and demonstrate a need to identify other variables influencing APT. Abdominal strengthening showed no effects on pelvic tilt nor did the strength of musculature attaching superiorly or inferiorly correlate to pelvic tilt. Changes within the kinetic chain, from bony structure misalignment, including lumbar lordosis and hyperpronated feet, have been documented and correlated with changes in the pelvic tilt (Khamis & Yizhar, 2007; Levine, Walker, & Tillman, 1997; Walker, Rothstein, Finucane, & Lamb, 1987).

The failure of our findings to identify a correlation between APT and H:Qk or H:Qh may be attributed to any of the following: small sample size (N = 8), conventional rather than functional isokinetic testing, or even patient positioning. This study was limited in participants due to time constraints for both the researcher and the participants. A follow-up study of this nature should include a larger sample size. The isokinetic testing unit used held limitations in that it was not capable of functional strength testing; therefore, participants were placed in non-weight bearing positions for testing. The lack of the functional assessment limited the ability of the researcher to assess the eccentric strength of the hamstrings.

## IMPLICATIONS FOR CLINICAL PRACTICE

Findings indicate that APT and H:Qk and H:Qh are not significantly correlated. The movement toward a significant relationship at slower speeds may suggest a further review of the testing protocol. Taking the biomechanical relationship of velocity and torque into consideration, the researchers identify a potential correlation of APT and H:Q ratios. Additionally, findings indicated a need for further assessment and or identification of variables that may affect APT in both the musculature surrounding the pelvis and the

bony structures influencing pelvic position. This study did not account for relationships among abdominal and lower back musculature and APT. If relationships exist among these factors, this could influence the assessment protocols for pre-participation examinations. Given the outcome of this study, the anterior pelvic tilt measure is not a necessary pre-participation measure in assessing hamstring strain risk.

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# Research

*Physical Activity and Change in Fitnessgram Scores in Arkansas Fourth Grade Children*
by Brett A Stone Arkansas Tech University

From 2010-2012, the Arkansas Tobacco Settlement Commission provided resources for public schools interested in increasing time students spent in physical activity (SPARK, 2010). Schools that accepted funding from the Arkansas Tobacco Settlement Commission were enrolled in the Child Wellness and Improvement Program (CWIP). Health risk in CWIP schools was measured, in part, by using the Fitnessgram—a criterion assessment battery that categorized health-related physical fitness scores as *high-risk, low-risk,* or *healthy*. Hypothesized in Arkansas was an increase in physical activity minutes during school hours would, in turn, improve physical fitness in students as measured by the Fitnessgram. The outcomes of such an experiment in Arkansas have public health implications, and could help decision makers understand the proper dosage of physical activity required during school hours to reduce health risks in Arkansas children.

The purpose of this study was to examine the relationship between minutes of moderate to vigorous physical activity (MVPA) and health-related physical fitness scores in 4$^{th}$ grade students enrolled in CWIP schools. Guided by the *Child Lifetime Physical Activity Model* (Fitnessgram, 2003; Pangrazi & Corbin, 2003; Corbin et al., 2013), and the *Physical Activity Guidelines for Americans* provided by the United States Department of Health and Human Services (USDHHS, 1996; USDHHS, 2008; USDHHS, 2018), this study compared MVPA minutes recorded by heart rate monitor to Fitnessgram physical fitness scores in 4$^{th}$ grade

participants. Six linear regression analyses were conducted to determine if MVPA minutes could predict positive change in 6 health-related physical fitness scores using Fitness gram criteria.

## Methodology

This study was an analysis of secondary data collected under University of Arkansas-Little Rock (UALR) Institutional Review Board (IRB) 11-162. In the 11-162 study, minutes of MVPA were obtained objectively using Polar RS400 heart rate monitors during physical education and recess periods in 4th grade students who volunteered over a 9-week period. Minutes of MVPA were defined as 50%-89% maximum heart rate (MHR). Physical fitness was measured during a pretest and posttest evaluation using the Fitnessgram physical fitness assessment battery where a posttest performance indicating improvement in raw fitness score defined positive change. With minutes of MVPA as the sole predictor variable, a level of significance at .05, and an effect size at .07 (small to medium effect size) (Cohen, 1988), linear regression (IBM Core, 2010) was used to determine the extent that minutes of MVPA during physical education and recess periods recorded by heart rate monitor could predict positive change in the following Fitnessgram measurements: aerobic capacity (Pacer Test), muscular strength (Push-Up & Curl-Up Tests), flexibility (Back Savor Sit and Reach Test), and body composition (BMI) scores.

## Sample

The sample in the 11-162 study was drawn from 4th grade students who volunteered from three participating CWIP schools and one non-CWIP school ($N$ = 116). Of the four participating schools, two were located in Northwest Arkansas, one was located in Northeast Arkansas, and one located in Southwest Arkansas. Aside from the age, gender,

height, and weight of the participants, no other identifying factors of the sample were known to the researcher.

## Results

Accumulated minutes of MVPA could predict positive change in aerobic capacity (Pacer Run) scores *R2*=.151, *F* (1,67) = 11.74, *p*<.001, 95% *CI* [123.01, 76.99]. In this analysis, students in the 11-162 study could expect 15% of the variance in aerobic capacity change scores from pretest to posttest to be explained by accumulated minutes of MVPA. Likewise, minutes of MVPA could predict positive change in muscular strength (Curl-Up) scores *R2* = .075, *F* (1,78) = 6.10, *p*<.016, 95% *CI* [111.96, 88.04]. In this analysis, students in the 11-162 study could expect approximately 8% of the variance in muscular strength fitness change scores from pretest to posttest to be explained by accumulated MVPA minutes. A Spearman Rank Order analysis confirmed the strength of the relationship between MVPA minutes and Curl-Up change in a two-tailed test. The results from the remaining regression analyses determined that MVPA minutes could not predict positive change in either push up, flexibility, or body composition scores.

## Conclusion

The premise to increase physical activity minutes in public schools to improve physical fitness in an effort to reduce health risks has potential to work in Arkansas. Consistent with *The Child Lifetime Physical Activity Model*, students in the 11-162 study were given adequate amounts of time to accumulate minutes of MVPA, and consequently, could expect 15% of the variance in aerobic capacity change scores and 8% of the variance in muscular strength change scores from pretest to posttest to be explained by accumulated minutes of MVPA. Of particular interest in the 11-162 study was that all schools enrolled in the CWIP program were required to

offer a minimum of 120 minutes a week of physical education classes. Two of the CWIP schools in the 11-162 study offered the minimum 120 minutes a week of physical education classes and 1 school offered 150 minutes a week of physical education. Recess times in those CWIP schools varied by district and offered additional opportunities for students to accumulate MVPA minutes. Two of the three CWIP schools in the 11-162 study provided recess opportunities. The non-CWIP school in the 11-162 study offered the minimum 60 minutes a week for physical education required by the state of Arkansas at the time (ADE, 2012). In addition, recess was also offered and provided additional opportunities for students to accumulate MVPA minutes. With one CWIP school in the 11-162 study scheduling 150 minutes of physical education each week and the remaining schools offering over 120 minutes of physical activity each week by combining both physical education and recess into the physical activity schedule, all schools in the 11-162 study were approaching a dosage of 150 minutes each week of physical activity during school hours. According to the *Physical Activity Guidelines for Americans (Children and Adolescents*) (USDDHHS, 2008) children should engage in 60 minutes of physical activity on most days of the week (30 minutes during the school day) and strive for the majority of those minutes to be at MVPA levels of intensity (USDHHS, 2008). The mean for MVPA minutes for the sample collected by heart rate monitor over nine weeks was 745.1 minutes (defined as 50%-89% MHR). When the mean is averaged over nine weeks, students participating in the 11-162 study accumulated approximately 82.78 minutes of MVPA per week.

## Discussion

"From a health perspective, good aerobic capacity has been shown to reduce all-cause mortality and the risk of hypertension, coronary heart disease, obesity, diabetes, some forms of cancer, and other health problems in adults, and clinical risk factors for cardiovascular disease

and metabolic syndrome in children and adolescents (Cureton et al., 2013). Any improvement in aerobic capacity can be interpreted as a successful step in the right direction for Arkansas. In this analysis, the accumulated minutes of MVPA contributed 15% of the variance in positive change scores for aerobic capacity and 8% of muscular strength test scores. Although 15% of the variance in positive change scores for aerobic capacity can be considered robust, caution must be taken when interpreting the results in this analysis. First, the sample in the 11-162 study was obtained with a nonprobability sampling technique using volunteer participants which threatens the external validity for this analysis. Without the random selection of participants, the ability to generalize the results of this analysis to the greater population are statistically compromised. Second, the 11-162 study ultimately concluded with a smaller sample size than expected due to attrition and incomplete data sets ($N$ = 92). There were 116 participants trained in the 11-162 study protocols but only 92 participants completed nine weeks of recorded physical activity during physical education and recess periods. With one predictor variable for this analysis, a sample size of 112 participants was calculated to obtain a significance of 0.05, and proposed *GPower* at .80 with respect to an effect size of 0.07. Since the Fitnessgram pretest and posttest scores were obtained over a total of six days in the 11-162 study (three days at the beginning and three days at the end), a student absence that occurred on either a pretest or posttest date resulted in an incomplete data set and eliminated from this analysis. Moreover, one school was unable to complete a height/weight and flexibility measurement which resulted in the elimination of those scores for analysis. In the aerobic capacity test (Pacer Run), there were 23 incomplete data sets eliminated from analysis (n=69) and 14 incomplete data sets eliminated from the muscular strength (Curl-Up) analysis (n=78). Because attrition and incomplete data sets contributed to a

reduced sample size in the 11-162 study, the results of this analysis on positive change scores could be limited in precision. Third, maturation, learned efficiency, environment, and genetics, most likely, influenced change in Pacer and Curl-Up test scores (Bar-Or, 1983; Pangrazi & Corbin, 2003; Corbin et al, 2013). Average change for participants with complete pre/post height and weight measurements found that the participants in the 11-162 study gained 1 inch in height and 8 pounds in weight during the nine-week measurement period ($n$ = 69). To help control for maturation differences, the Fitnessgram defines age- and gender-specific performances by criteria. That is, a range of scores is defined as either *healthy*, *needs improvement*, or *unhealthy* for each age and gender group. This type of control accommodates for maturation differences among participants who may be, for example, 10 years 1 month or 10 years 11 months. Because growth and maturation confound the interpretation of fitness scores in children (Bouchard, 1993; Malina, et al., 2004, Corbin et al., 2013) the Fitnessgram Advisory Council suggests that there are threats to internal validity on fitness measures, and consequently, do not recommend using Fitnessgram as a programmatic assessment tool (Corbin et. al., 2013). Since laboratory-style fitness measures at the macro level are not logistically or economically advantageous to deploy, Fitnessgram and other norm/criterion-referenced assessments are often used to assess fitness in health promotion programs. The results from such practices—particularly when using pretest/posttest designs in youth populations—must always be interpreted with caution (Corbin et.al., 2013). Fourth, accumulated minutes of MVPA could not predict positive change in muscular strength (Push-Up) scores $R2$ = .000, $\underline{F}$ (1,85) = .023, $\underline{p}$<.880, 95% *CI* [-1.73, .71]. There were 25 incomplete data sets in this analysis. Likewise, minutes of MVPA could not predict positive change in either flexibility or body composition test scores. Flexibility in the 11-162 study was measured using the Back Savor Sit and Reach assessment on both left and right

legs *R2* = .005, *F* (1,67) = .314, *p*<.577, 95% *CI* [-.401, .939] and *R2* = .011, *F* (1,67) = .734, *p*<.395, 95% *CI* [-.326,.894] respectively. There were 25 incomplete data sets in this analysis. Body composition was measured using Body Mass Index (BMI) screening *R2* = .024, *F* (1,68) = 1.65, *p*<.204, 95% *CI* [-.401, .939]. There were 23 incomplete data sets eliminated from the body composition analysis. Because the *quality* and the *types* of physical activity that took place during physical education and recess periods in the 11-162 study were not recorded, additional analyses would be required to determine whether the *quality* and *types* of physical activities in the 11-162 study were *specific* to improve either muscular strength, flexibility, or body composition scores.

Finally, all schools in the 11-162 study were advancing towards a schedule of 150 minutes a week of physical activity. This is a critical consideration for future analysis as this dosage would likely be considered by educational administrators in Arkansas as a high threshold of time devoted to one specialized content area in a public school setting. On the other hand, it is considered to be the minimum threshold during school hours needed for health protection among youth populations (USDHHS, 1996, 2008, 2018). Additional analyses are needed to help close this logistical and theoretical gap in our understanding of proper dosages of physical activity required in Arkansas public schools for children to receive health protection from improved fitness. Of particular interest is the predictive power of physical education programming compared to that of physical activity programming during school hours for the purpose of improving childhood fitness. Further investigation in this area could establish the efficacy of such programs as CWIP in Arkansas. Moreover, additional investigations could help determine whether managerial practices of such fitness promotion programs create gaps in our understanding of a proper dosage of physical activity in Arkansas public schools by failing to

distinguish between minutes scheduled for physical activity and the actual minutes engaged in MVPA during that scheduled time. The CWIP schools in Arkansas were successfully providing a framework for all public schools to follow for the promotion of child fitness and additional analyses would help to determine if those models can be logistically and economically successful.

## Recommendations

The results of this analysis are foundational and serve as a first step in the process of determining the extent to which physical education and physical activity programs in Arkansas public schools impact fitness and health in school-aged children and adolescents. Two of the six analyses in this study confirmed that MVPA minutes contributed to a significant portion of the variance in positive fitness change scores as measured by Fitnessgram. To gain further insight into the effects of accumulated MVPA minutes on childhood physical fitness during public school hours using Fitnessgram measures, it is critical that future analyses include methodologies centered on dose-response theoretical constructs. The 11-162 study deployed scheduled dosages of physical activity approaching an upper threshold of 150 minutes a week. Future investigations should include the predictive nature of MVPA minutes on childhood fitness at dosages of 40, 90, and 120 minutes of scheduled physical activity each week to determine if outcomes as measured by Fitnessgram are significantly different at those dosages. In addition, future studies should include a record of the quality and types of physical activity performed during school hours to determine if those activities are specific to the improvement in fitness as measured by Fitnessgram. Of particular interest here is the extent to which physical activity during physical education influences health over and above recess or other physical activity programming. The reverse is also of interest. A

replication study or additional multivariate analysis using a randomized sample that represents populations from different regions of the state has potential to capture the extent to which minutes of MVPA protects and promotes the health of Arkansas youth. The results have many implications for public policy in Arkansas, especially for decision makers who must consider physical activity policies and programming in public schools.

**Acknowledgement**:

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# Research

## *Enhancing the Fitness and Academics of Children using Technology in the Schools (FACTS): Pilot*

Shelia L. Jackson, Arkansas Tech University, Cathryn Bass, Center Valley Elementary and Kaitlin Burgess graduate student, Arkansas Tech University.

Physical activity is considered one of the most important components in preventing and decreasing childhood obesity (Centers for Disease Control, 2013), and researchers found it increases the cognitive and academic performance of children (Basch, 2011; Best, 2012, & Ploughman, 2008). Activity trackers are used both to motivate the wearers to be more active and to accurately measure activity (Harris, 2016; Horne, Hardman, Lowe, & Rowlands, 2009; Miller & Mynatt, 2014). Arkansas public schools are responsible for students meeting Arkansas Computer Science Standards (2016) as well as Arkansas Physical Education Standards (2013). Therefore, the project, Enhancing the **F**itness and **A**cademics of **C**hildren using **T**echnology in the **S**chools (Enhancing the **FACTS**) was designed to determine if using activity trackers with elementary children can positively impact students' physical activity and technological skills, and this pilot study was conducted to determine the best methods to do this and incorporate these into the primary study with three other elementary schools as well as answer questions using the trackers specific to the pilot school.

The purpose of the pilot was to determine (a) the effects of children using activity trackers for monitoring their in-school activity, (b) if syncing Fitbits during physical education decreases physical activity, and (c) if fitness club participation during school significantly impacts physical activity.

*Methods and Procedures*

Prior to contacting the student's parent/s or guardian/s, this research was approved by the Institutional Review Board at Arkansas Tech University. Fourth grade students from a rural elementary school who received consent from their parent/s or guardian/s participated in this study.

All students wore Fitbit Charge HR activity trackers and Yamax SW-200 Digi-Walkers from 8:00 a.m. to 3:00 p.m. on the one day a week they received physical education for 12 weeks. The Yamax Digi-Walker SW-200 is considered one of the most accurate and reliable pedometers on the market (Bassett, Ainsworth, Leggett, Mathien, Main., Hunter, & Duncan, 1996) and often used as the criterion by which other pedometers are validated (Bassett, Ainsworth, Swartz&, Strath., 2000, Crouter, Schneider, Karabulut, & Bassett, 2003; Schneider, Crouter, & Bassett., 2004). Gardner, Voss, Dean, and Harris (2016) found the Fitbit Charge HR to be valid for measuring the steps of children, and many researchers have used this device in studies with children (Kang, An, Hang, & Lee, 2017; Harris, Cortina, Templin, Colabianchi, & Chien, 2018).

We randomly assigned the four classes of fourth graders (N = 65; 25 males; 40 females) to one of the following four conditions: ONE, the students monitored their steps throughout the day by looking at their activity trackers; TWO, same as ONE except students recorded their number of steps as shown on the activity trackers at the end of the day; THREE, same as TWO except instead of recording their number of steps, the students charted their Fitbit and Digi-Walker steps in both a line graph and bar graph format; and FOUR, same as ONE except the students synced their Fitbits with a computer and viewed their data using the Fitbit software program.

All recording, charting, and syncing occurred during their last period, physical education

class which they had one day a week. In addition to the various treatments, at the end of the physical education class, when the students turned in their activity trackers, they were given pencils and received slips of paper with the date, a fitness fact, and space for them to write how many steps they got that day to take home. Prior to beginning 10 weeks of participating in one of the four conditions, two weeks of baseline step data were gathered

wearing the Fitbits. At the end of 12 weeks, an Analysis of Covariance (ANCOVA) was applied to the Fitbit step data (covarying on baseline step data) using the SPSS statistical package.

*Does Syncing Fitbits during Physical Education Decrease Physical Activity?*

Thirty-six fourth grade students (n = 14 males, n = 22 females) participated in this study. We randomly assigned one of the four classes (Group A) to sync their Fitbits with a computer and view their data using the Fitbit software program during last period physical education class. Group B, the control group, was formed by matching students from the other three classes with Group A based on gender and BMI. On the tenth week, neither group synced their Fitbits with the computer.

Using the Fitbit software program, we calculated the number of steps taken during physical education on the ninth and tenth weeks for both groups and using the SPSS statistical package, applied the data to two paired t-tests. In order to decrease the chance of making a Type I Error with the inflation of alpha with multiple tests, a Bonferoni adjusted alpha of .025 was used to determine significance.

*Effects of In-School Fitness Club Participation on Physical Activity*

Seven fourth grade students participating each school day in a 30-minute Fitness Club (Group A, females = 5, males = 2) were matched (based on gender and BMI) with their classmates (Group B, females =5, males = 2) participating in other school clubs (i.e., art,

computer, chess, etc.). Physical activity was measured by the number of steps taken as recorded from Fitbit Charge HR activity trackers. Participants wore the Fitbit Charge HR once a week for six weeks during the school day, and we recorded their steps as indicated on the Fitbits. Using the SPSS statistical package, we applied the step data to a paired t-test.

The average BMI of the Fitness Club (Group A) participants was 18.98, and the average BMI of the matched Non-Fitness Club (Group B) participants was 18.29. The mean number of steps of Group A (Fitness Club/FC) was 6962.12 steps, and those of Group B (Non-Fitness Club/NFC) was 5343.13 steps.

The results of the paired t-test applied to the step data of the two groups found Group A (FC) had significantly ($t = 3.744$; $p < .01$) more steps than Group B (NFC). Further analysis using the Fitbit software indicated that Fitness Club participation contributed over 20% of the total number of steps for that group.

Table 1

Mean Number of Steps During Fitness Club, Recess, and Physical Education

| | Group A (FC) | Group B (NFC) |
|---|---|---|
| Fitness Club | 1522.12 | NA |
| Recess | 1906.17 | 1641.84 |
| Physical Education | 1858.56 | 1625.95 |

*Results,*

Levene's test and normality checks were carried out and the assumptions met. The results of the ANCOVA found a significant difference among the groups ($F = 4.572$, $p = .006$). Post

Hoc tests revealed students in Condition THREE/Charting had significantly less steps than those in Conditions ONE/Looking (p = .005) and FOUR/Syncing (p = .027).

*Does Syncing Fitbits during Physical Education Decrease Physical Activity?*

The results of the paired t-test on Group A's step data found a significant difference (t = 2.77; *p* = .013) between the mean number of steps taken during physical education on the ninth week (1745.22 steps) and those taken during the tenth week (2006.56 steps) when they did not sync Fitbit data to the computer. There was no significant difference (t = 1.93; *p* = .07) between the mean number of steps for weeks nine (1549.17 steps) and ten (1743.72 steps) for Group B (Control).

*Discussion, and Recommendations*

The time taken to chart the data during physical education might have impacted students' physical activity. Recommendations for future studies include (a) either having the students chart their data outside of physical education class or only use one of the charting formats and (b) to have the face of the Fitbit covered so baseline step data can be gathered without providing feedback to the students  Students looking and syncing data onto the computer had significantly greater number of steps than students who charted their Fitbit and Digi-Walker step data. The number of steps in physical education where students synced their Fitbits to a computer was significantly less than the class where they did not sync.

There was no significant difference in the number of steps taken in physical education by students who had the same lessons taught by the same teacher who did not sync their Fitbits in either class. This indicates that the significantly fewer steps taken by Group A during the ninth lesson was most likely due to the time they spent syncing their Fitbits to the computer and not because of the lessons. Because of the time it takes to sync the Fitbits to the computers,

investigators should either have the students do this outside of the physical education class or sync the Fitbits themselves.

Koplan, Liverman, and Kraak (2005) recommend children get 30 minutes of moderate-to vigorous physical activity (MVPA) and be physically active for 60 minutes during the school day. Research also indicates that elementary physical education lessons that focus on fitness activities, such as the using fitbits,  and have less than 25 students have significantly higher MVPA (Kirkkham-King, Brusseau, Hannon, Castelli, Hilton, & Burns, 2017).  Fitness Clubs that are established in elementary schools can  provide an additional method for children to meet these recommendations. .Fitness Clubs during school can significantly increase the activity level of elementary students along with adding Fitbit recommendations.

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## Call for Research  Posters

The Research Section of **SHAPE Arkansas** invites members to present their research posters at the annual State Convention. Submit your abstract to the Vice President of Higher Education\Research\Award by the end of September each year.


## State Convention

SHAPE Arkansas State Convention Nov. 7-9, 2020, Arkansas Tech University, Russellville, Arkansas

**Forms for Presenting at State Convention must be submitted before April of each year to the state convention Program Coordinator. The Form can be found in the Appendix of the Constitution in the Arkansas Journal and on SHAPE Arkansas website, extension of proposal may be allowed.**

## Submission to Arkansas Journal

**Future Submission to Arkansas Journal must be submitted on the forms that can be found in the Appendix of the Constitution in the Arkansas Journal and on SHAPE Arkansas website by the end of April of each year. Authors will be notified if their submissions have been accepted and what revisions may need to be done.**

**Submit your TOY nominations online or email directly to the TOY standing committee chair by end of September of each year. Forms can be found in the constitution appendix on SHAPE Arkansas website and end of the Arkansas Journal.**


## 2019 Teacher of the Year Awards (TOY)

Our 2019 Elementary Physical Education Teacher of the Year Award goes to Elizabeth McCarty.
Elizabeth presently teaches at MA Hardin Elementary School in the White Hall School District. Her principal Jeff Glover nominated her and calls her Betsy. Describes Betsy as one who researches for better instructional practices that she can better her programs. She has implemented language and math content into her physical education classroom to help show students the practical approach through physical education activities. She has been in the White Hall School District for 22 years, taught 5 years in New jersey and Pennsylvania. She is a graduate from Springfield College in Massachusets. Congratulations Betsy!

Our 2019 Middle School Physical Education Teacher of the Year goes to Dominque Battles from Lakeside School District in Hot Springs Arkansas. He was nominated by his school principal Jamie Preston. Her description of Coach Battles is that he has the most amazing physical education lessons. He recently did a lesson that he had seen on ESPN where the students moved through hula hoops, played a game when they met each other, and always leave his classes red face and with lots of smile. He cares about his students meet them before and after class and follows up with counselors\parents to make sure that they are successful outside his classroom. Dominque is pusuring his doctorate work in Education leadership at Arkansas State University where he was a undergraduate as well. . Congratulations Dominque!

Our 2019 Health Teacher Award Goes to David Johnson. David was nominated by Lisa Mundy our School Health and Physical Education coordinator from Arkansas Department of Education. David has been teaching in the Quitman School District for the last 11 year. David presently is the K-12 health and physical education teacher and coordinator at Quitman. David is also a part of the ongoing 2019 PE and health education standards work group for the Arkansas Department of Education. David also coaches football for Jr and Sr. High. David has a passion for people to live a healthy lifestyle. Davids main focus in health Education is mental health, teen suicide, and effects of alcohol, drugs and tobacco. He believes the next 5 years will be critical in the lives of our children. He is a graduate of the University of Central Arkansas. Congratulations David.

## Constitution Appendix

Appendix A: Honor\Lifetime

Appendix B: Higher Education Award

Appendix C: Student Scholarship Application

Appendix D: Arkansas Journal Application

Appendix E: SHAPE Arkansas Necrology Report Form

Appendix F: Teacher of Year (TOY)

Appendix G: SHAPE Arkansas State Convention Program

Appendix H: State District Maps

Appendix I: Co-Chairs Future Professional University Rotations

## APPENDIX A: HONOR\LIFETIME AWARD

**I.** Each candidate must:

A. Be at least 30 years of age and possess a Master's Degree or its equivalence/or higher. Either of these qualifications may be waived by a unanimous vote of the committee.

B. Have served in the profession of HPERD for a period of at least 5 years prior to the nomination.

C. Be a current member of the association. Former members who have retired from professional work may be exempt from this requirement.

D. Be a person of high moral character and personal integrity who has made outstanding and noteworthy contributions to the advancement of HPERD in Arkansas.

**II.** Application Procedures for Nominations

A. Any association member may submit nominations for the honor award by sending copy of the candidate's qualifications to the committee chair by September 15.

B. An invitation to submit names of candidates for the honor award shall appear annually in the news- letter or the Arkansas Journal.

C. If possible, candidates shall not be advised they are nominated for the honor award.

**III.** Committee Procedures:

A. All committee correspondence is to be regarded as confidential, and therefore, should not be shared with anyone other than committee members.

B. Nominations with the required information shall be submitted to the committee chair no later than September 15. As soon as nominations are received the chair shall screen all nominees according tothe eligibility requirements. The chair shall then supply the committee with (a) a copy of the operating code and (b) the complete information concerning current nominees.

C. The number of honor awards to be presented in one year shall not be more than four. However, the committee may elect not to present any awards. The committee shall endeavor not to concentrate the honor award in any one area or educational level.

## APPENDIX B
## HIGHER EDUCATOR OF THE YEAR AWARD

**I.** Each candidates must:

A. Be employed by an institution of higher education in Arkansas.

B. Be a member of the association.

C. Have served the profession of HPERD for a period of at least 3 years prior to nomination.

D. Be a person of high moral character and personal integrity who has made outstanding and noteworthy contributions to the advancement of teaching, research, and/or service to Arkansas.

**II.** Application Procedures

A. Any association member who resides in the state may nominate a candidate by sending a copy of the candidate's qualifications to the committee chair by September 15.

B. A nomination invitation shall be mailed to each HPER Department Chair in Arkansas institutions of higher education, along with rules for nominating, criteria for selection, and a cover letter about the award.

**III.** Committee Procedures: The chair shall present each committee member with a complete list of candidates to be considered for the current year. This shall include qualifications/biographical sketch of each candidate.

**IV.** Recognition and Presentation

A. The chair shall (a) submit a copy of the award recipient's qualifications to the president and executive director by October 1; (b) insure that the award recipient is in attendance at the Awards' Luncheon for the presentation; and (c) present the award.

B. The executive director shall be responsible for making arrangements for the actual award. The chair shall submit an itemized account of the expenses incurred for the preparation of the award.

**Appendix C: Student Scholarship Application**

Date_____

Candidate: _____

College/University: _____

Home Address: _____

_____

Age: _____ Birth Date:__/____/_____

Grade Point Average:_____ Hours completed as of October 15:__

Submit a brief paper entitled, "Why I Have Chosen the Health, Physical Education, Recreation, and/or Dance Profession for a Career." Include a recent photograph. Include an up-to-date college/university transcript. Include 3 letters of recommendation to support candidacy.

Background in SHAPE Ark (activity involvement)

Other Activities to Consider for this application:

## Appendix D: Submission Instructions

*Arkansas Journal* Submission Guidelines for Authors

Material for publication and editorial correspondence should be emailed to Bennie Prince at (bfprince@ualr.edu). Deadline for the submission is March 31. Guidelines for materials submitted are those of the Publication Manual of the American Psychological Association (APA). All submissions must be double spaced, 12 font, Times New Roman, and limited to 10 pages for review and publication in the *Arkansas Journal*.

Indicate manuscript category: Faculty research, student research, or both. There will be new categories where researchers and writers can submit their well thought out commentaries on issues involving, new research, trends, and special topics concerning our profession. Examples of these type articles can be viewed in *Research Quarterly for Exercise and Sports.*

The review process is a BLIND REVIEW and is reviewed by at least two (2) reviewers.
The review research is structured as stated below:

**The scientific review** – The review is focused on the article's content. The scientific review is completed by the reviewers, who are specialists in the area of Health and Physical Education, and associated fields. The Journal editor is responsible for collecting all review questionnaires and informing author of submission acceptance or rejection.

For manuscripts submission and review submit 3 documents that follow the template below.

**(Submission Template)**
**First Submission Attachment-Editor**

**Title of Manuscript submitted**_____
**Submission Category**_____
**Author or Author(s) Name**_____
**Author or Author(s) University, Position, address, phone number, email**
_____
_____
_____
_____
_____

Scientific review and research follow APA format

_____

_____

_____

_____

Total 10 pages for review process and if selected these 10 pages will be in the *Arkansas Journal*.

Scientific review would include: Abstract, Introduction, Methods, Data Analysis, Results,

Discussion and Conclusion.

_____

_____

_____

_____

Total 10 pages for review process and if selected these 10 pages will be in the *Arkansas Journal*.

**Third Submission Attachment-Editor**
**Complete Manuscript**

**Title of Manuscript submitted_____**
**Submission Category_____**
**Author or Author(s) Name_____**
**Author or Author(s) University, Position, address, phone number, email**
**_____**
**_____**
Scientific review and research follow APA format_____
_____
_____

## Appendix E: SHAPE Arkansas Necrology Reporting Form

**Full name of the deceased, including nickname, if any**

**_____**

**Age at death _____**

**Residence at death: city, state, zip**

**_____**

**Survived by: Spouse, Children (in order of date) Grandchildren, Great-grandchildren, Great-great-grandchildren**

**_____**

**# of Years as a SHAPE Arkansas Member_____**

**# of Years as a SHAPE America Member _____**

**Any SHAPE helped at either State or National level**

**_____**
**_____**
**_____**

**Employment and Professional History that supported SHAPE Arkansas**

**_____**
**_____**
**_____**
**_____**

**Second Submission Attachment- For Blind Review**

**Title of Manuscript submitted_____**
**Submission Category_____**

## Appendix F:

## TEACHER OF THE YEAR (TOY) AWARDS

**I.** Each candidate must:

A. Have served the profession of health, dance, elementary physical education, or secondary physical education for a period of at least 3 years prior to the nomination.

B. Be a member of the association. Applications can be submitted online

C. Be a person of high moral character and personal integrity who by their leadership and industry have made outstanding and noteworthy contributions to the advancement of teaching health, dance, or physical education in the state.

D. Be employed by a public school or higher education system in the state or other public health agency (health award).

E. Any association member or K-12 professional administrator who resides in the state may submit names of candidates by sending the completed TOY Nomination Form to the Committee Chair by **May** 15.

F. The committee shall choose4 TOY award recipients one each for health education, dance, elementary physical education, and secondary physical education.

G. The chair shall submit a copy of all award recipients' qualifications and nominations for the TOY awards to the president and executive director. The chair is responsible for press releases and publicity.

H. The chair will notify the award recipients and request that they attend the state convention for recognition and presentation.

I. The executive director shall (a) be responsible for the awards and (b) prepare an awards' program for distribution at the Award's Luncheon. The chair shall make the presentations at the Awards' Luncheon.

**APPENDIX G:**

**SHAPE ARKANSAS CONVENTION PROGRAM PROPOSAL**

DIVISION/SECTION_____ CHAIR_____

SPEAKER_____

TITLE OF RESENTATION_____

_____

BRIEF
DESCRIPTION_____

_____

_____

_____

_____

_____

_____

PROGRAM DAY/TIME REQUESTED (check one)

____Thursday PM ____Friday AM ____Friday PM

---

TYPE OF PROGRAM:

___Lecture ___Participation ____Other (specify)_____ TYPE OF ROOM

SEATING:

___Theater ____Round Table

Describe if necessary_____

_____

_____

---

EQUIPMENT NEEDED:

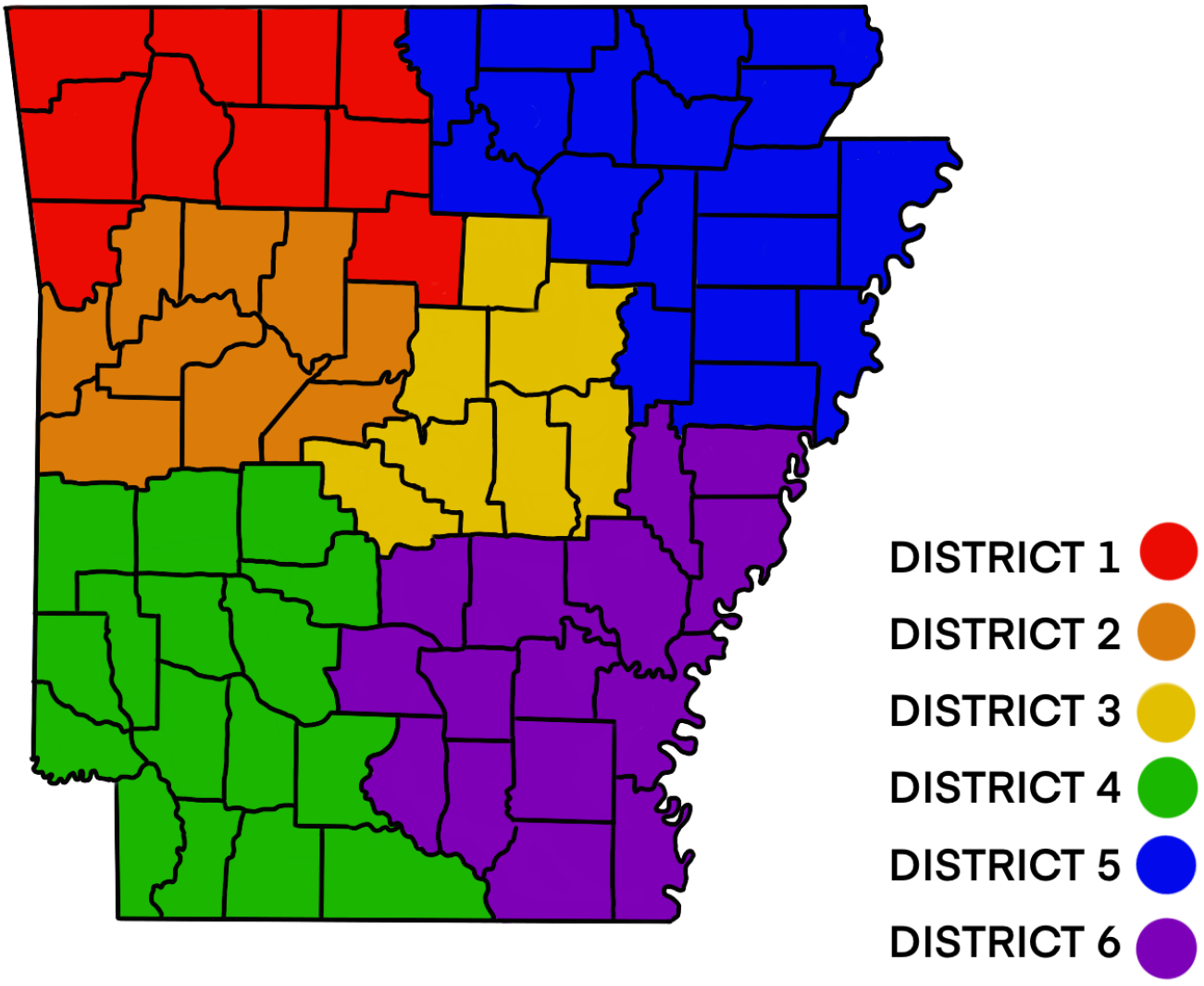
___Podium/microphone

___Tables

Other--describe_____

ADDITIONAL INFORMATION _____

**Appendix H: 5 Districts of SHAPE Arkansas**



## Appendix I: Co-Chairs Future Professional Universities' Rotation

Future Professionals – serve 1 year

Henderson State University term ends 2019
Harding University 2020
Southern Arkansas University Magnolia 2021
University of Arkansas Pine Bluff 2022
Arkansas Tech University 2023
University of Central Arkansas 2024
Arkansas State University 2025
University of Arkansas at Little Rock