Barfield JP, Cobler DC, Lam ET, Zhang J, Chitiyo G. Differences between African-American and Caucasian students on enrollment influences and barriers in kinesiology-based allied health education programs. Adv Physiol Educ 36: 164–169, 2012; doi:10.1152/advan.00129.2011.—Kinesiology departments have recently started to offer allied health education programs to attract additional students to teacher education units (9). Although allied health professions offer increased work opportunities, insufficient enrollment and training of minority students in these academic fields contribute to underrepresentation in the workforce (3). To improve workforce diversity, kinesiology departments must understand how enrollment influences and barriers differ by race among prospective students. Therefore, the purpose of this study was to identify differences in allied health education enrollment influences and enrollment barriers between minority and Caucasian students. Participants (n = 601) consisted of students enrolled in kinesiology-based allied health education programs. Multivariate ANOVA was used to compare group differences in enrollment decision making. “Personal influence,” “career opportunity,” and “physical self-efficacy” were all significantly stronger enrollment influences among African-American students than among Caucasian students, and “social influence,” “experiential opportunity,” “academic preparation,” and “physical self-efficacy” were all perceived as significantly greater barriers compared with Caucasian students. Findings support the need to recruit African-American students through sport and physical education settings and to market program-based experiential opportunities.

**Factors That Affect Enrollment in Allied Health Education**

In the latest review of allied health education decision making, six primary factors have been identified as important influences on enrollment (7): personal influences (e.g., high school teacher), social influences (e.g., diversity of the program), academic preparation, career opportunity, individual aspiration (e.g., desire to help others), and physical self-efficacy (e.g., success in sport or positive high school physical education experience). Individual aspiration and physical self-efficacy are the most important enrollment influences among allied health education students compared with students enrolled in alternative degree programs. Although several of these factors are consistent with many science-based enrollment influences, self-efficacy in sport and physical education appear unique to allied health education.

A similar review of enrollment barriers revealed five distinct factors: social influences (e.g., attitudes of the faculty toward race and culture), experiential opportunity (e.g., access to job shadowing), academic preparation, physical self-efficacy, and self-management (e.g., workload in the required courses) (6). It is not surprising that overlap exists among several influence and barrier factors. Few high school programs include courses within the allied health field; therefore, mentoring offered by allied health teachers or professionals may be present (potential influence) or not (potential barrier). Regardless, institutions must recognize that important personal, environmental, and behavioral factors affect the enrollment decision making of prospective allied health education students. To target potential
students effectively, institutions and programs must address these factors within their marketing efforts.

Role of Race in Allied Health Education Recruitment

Racial and ethnic diversity in many allied health professions have not kept pace with demographic changes in the general population of the United States (15). Although Caucasians are still the majority, this group will eventually become the nation’s largest minority group as a majority of any single race disappears. By 2050, the proportion of African-Americans in the United States will increase from 13% to an estimated 15%; Hispanics, from 13% to 24%; and Asians, from 4% to 8% (9a, 12). African-Americans, Hispanics, and Native Americans already receive less and lower-quality healthcare than do Caucasians (16, 34, 37). With the expected demographic changes, the lack of minority health professionals will only compound the nation’s persistent racial and ethnic health disparities. Minorities perceive their healthcare to be better when the professional is of similar racial or ethnic background (8). Unfortunately, many allied health professions, including those in kinesiology-based settings, are not prepared to meet the challenges of an ever-changing demographic (22). This fact highlights the need for institutions to effectively recruit and educate prospective allied health professionals who represent minority races.

Identifying minority applicants for allied health education continues to be a challenging task. Allied health professions, in general, have long struggled to recruit and retain minorities; although the numbers have improved, much work must still be done (15, 22). To a great extent, insufficient enrollment and training of minority students in allied health education contribute to their underrepresentation in the workforce (3, 18, 20, 33). Therefore, kinesiology departments must understand the influences and barriers that affect enrollment into allied health education among prospective minority students.

The deficiency of minorities in allied health education is widely recognized by kinesiology-based professional associations. Like many health organizations, professional associations in athletic training, exercise science, occupational therapy, and physical therapy have developed Diversity Committees to help attract and retain interested minorities by offering scholarships, leadership opportunities, and/or mentoring programs. Membership data of the American Physical Therapy Association showed that only 11% of physical therapy professionals and only 19% of physical therapy students are minorities. These numbers are important, given that clients perceive their healthcare most appropriate when provided by someone of the same ethnic and cultural background. This perception ultimately yields better client outcomes (14, 35, 37). However, increasing the number of minority students in physical therapy programs alone may not correct the problem, because minority students have a higher rate of attrition than do Caucasian students.

Factors that contribute to the underrepresentation of minority students in physical therapy programs are consistent with allied health education barriers in general. Specifically, barriers to minority enrollment in this field include financial cost, academic preparation, a lack of positive role models of the same ethnic background, and poor communication skills. Communication is a particularly crucial factor for successful patient outcomes in this field, and minority students in physical therapy appear to be impeded in this regard (12, 35). The lack of minority students in physical therapy and physical therapy assistant programs also may relate more to the location of the schools as opposed to the actual number of students, given that many minority students are enrolled at a relatively small percentage of schools that offer such programs.

Athletic training is another example of an allied health profession that struggles to attract minority students. According to the Ethnic Diversity Advisory Committee’s latest report (27), although the proportion of minority members has increased from 7% to almost 19%, only 18% of the students enrolled in accredited athletic training programs report themselves as minorities. Athletic trainers have historically been Caucasian and male (78%). Although efforts to attract women to the profession have been somewhat successful (45% of the membership is now female), the same cannot be said of attracting minorities. As with other allied health professions, the lack of role models with the same ethnic background could be keeping some individuals out of the profession (19, 30).

Statement of Problem

Institutions typically recruit students into allied health education through general marketing efforts (e.g., open houses, flyer mailings, etc.). Despite the ability to recruit students into kinesiology-based allied health education, programs have not been successful in recruiting minority students. This outcome may stem from distinct enrollment influences and enrollment barriers among ethnicity groups. Based on allied health representation, marketing efforts are clearly successful at targeting Caucasian students but not alternative ethnicity groups. To better target and recruit students from non-Caucasian populations, kinesiology units must understand how minority students differ from Caucasian students relative to factors that encourage or discourage enrollment in allied health education. The purpose of this study was to identify differences on enrollment influences and enrollment barriers between minority and Caucasian students in kinesiology-based allied health education programs. If differences can be found in recruitment perceptions among various demographic groups, kinesiology units can be more effective in recruiting, matriculating, and graduating minority students, ultimately yielding greater numbers of minority professionals. This outcome will unquestionably enhance allied health care for an increasingly diverse society.

MATERIALS AND METHODS

Participants

As a part of a larger study investigating general enrollment influences and enrollment barriers associated with allied health education programs, research participants in the current study (n = 601) were recruited from one state system of higher education in the United States. Participants had a mean age of 23.7 (SD 7.6) yr, and we extracted individuals with a self-reported kinesiology-based degree program in allied health education for analysis (n = 222). The final sample included students enrolled in athletic training, exercise science, physical therapy assistant, prephysical therapy, and preoccupational therapy programs of study in 2- or 4-yr academic higher education institutions. Institutional Review Board approval
was obtained before the start of the study, and informed consent was required for participation.

**Instruments**

The Scale for Allied Health Enrollment Decision (SAHED) and Scale for Allied Health Enrollment Barrier (SAHEB) were used to assess racial differences on enrollment decision-making and enrollment barrier factors. The SAHED and SAHEB have been validated through exploratory factor analyses, confirmatory factor analyses, and discriminant function analyses (6, 7). Factors and representative survey items are shown in Table 1.

**Procedures**

Department administrators overseeing allied health education at five 4-yr and five 2-yr colleges were contacted about the study. Upon approval from administrators and Institutional Review Boards from all institutions, allied health education faculty members were contacted about administering the SAHED and SAHEB to current students. A cover letter describing the project, informed consent, demographic questions, and two scales were mailed to participating faculty members. To maximize external validity in the sampling process, each institution was asked to distribute the survey to three different sections of allied health education students. All 10 institutions cooperated and returned completed student surveys; however, 2 of the 5 community colleges returned <10 completed surveys. Data collected from these two institutions were excluded from the study.

**Data Analyses**

A disproportionately smaller number of Hispanic (n = 12) and Native American (n = 4) students completed the survey; consequently, minority students were delimited to African-Americans. The resulting sample for comparison of the two racial groups on the SAHED thus consisted of 58 African-American students (28%) and 148 Caucasian students (72%). Because not all students completed both surveys, the resulting sample for comparison on the SAHEB consisted of 50 African-American students (27%) and 135 Caucasian students (73%). Multivariate ANOVAs (MANOVAs) were conducted to compare group differences between African-American and Caucasian students on the six factors of the SAHED and the five factors of the SAHEB. Levene’s test for equality of variances showed that the two racial groups were approximately homogeneous with respect to most dependent measures on both enrollment influences and enrollment barriers. All analyses were conducted using SPSS for Windows (version 17.0, IBM, Armonk, NY).

**RESULTS**

Mean scores for each enrollment influence and barrier by racial group are shown in Tables 2 and 3, respectively. Without exception, mean scores for enrollment influences and perceived barriers were higher among African-American students compared with Caucasian students. Stated differently, African-American students perceived enrollment influences as more important to their decision to enroll in allied health education than did Caucasian students. African-American students also...
perceived barriers as greater deterrents to possible enrollment in allied health education.

**Enrollment Influences**

MANOVA findings on enrollment influences are shown in Table 2. Using the 0.05 level of significance, African-American students perceived influences to be significantly more important to their enrollment decision than did Caucasian students \((P = 0.01)\). The specific factors for which there were significant differences between Caucasian and African-American students were personal influence, career opportunity, and physical self-efficacy.

**Enrollment Barriers**

MANOVA findings on enrollment barriers are shown in Table 3. African-American students perceived barriers to be significantly greater obstacles to enrollment than did Caucasian students \((P = 0.03)\). Univariate analysis for each enrollment barrier outcome showed significant differences for social influence, experiential opportunity, academic preparation, and physical self-efficacy.

**DISCUSSION**

The present study identified several significant differences in allied health education enrollment influences and enrollment barriers between African-American and Caucasian students in kinesiology-based programs. This finding is important because empirical evidence has shown the limited success of programs in reaching targeted segments of students from ethnic minority backgrounds \((3, 8)\). The limited success in athletic training and physical therapy highlights the fact that minorities are underrepresented in the healthcare workforce, in part because of underrepresentation in academic programs \((3, 18, 20, 33, 38)\).

Higher education institutions recruit students through a variety of marketing strategies, including open houses, high school visits, and campus tours for potential students. Once an institution has identified interested students, kinesiology departments and/or programs typically have the option of sending program-specific recruitment materials or setting individual meetings between students and program faculty members. Unfortunately, allied health education faculty and staff usually lack adequate knowledge of key elements that affect the decision making of potential students \((28, 29)\). Findings from the present study will help kinesiology programs determine how to better recruit African-American students into allied health education.

**Enrollment Influences**

**Personal influence.** This factor is most closely associated with mentoring, and African-American students perceived this influence to be more important to their enrollment decision than did Caucasian students. Personal influences can be parents or teachers, but the most effective mentor appears to be an allied health professional \((3)\). Because allied health is not a typical high school course, it makes sense that a personal influence is needed to encourage prospective students to enroll. What is surprising, however, is that the importance of the influence varied by racial group. Although this distinction is not readily explained in the literature, the finding documents the need for kinesiology-based programs to target African-American students through mentors (e.g., teachers and/or coaches).

**Career opportunity.** This factor is similar to other job-related factors, such as income and prestige, that encourage enrollment into allied health education \((29)\). In the present study, this factor was more important to African-American students regarding their decision to enroll, highlighting the need to promote job opportunities within recruitment materials. Considering that students may have limited exposure to allied health education curricula during high school, recruitment materials targeting prospective African-American students should accentuate job opportunities through kinesiology-based options within general marketing materials. Program leaders should also recognize that a high number of nontraditional

**Table 2. Multivariate ANOVA comparing enrollment influence scores between African-American and Caucasian students**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>African-American Students</th>
<th>Caucasian Students</th>
<th>F Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal influence</td>
<td>9.4 ± 4.5</td>
<td>7.8 ± 3.7</td>
<td>6.50</td>
<td>0.01</td>
</tr>
<tr>
<td>Social influence</td>
<td>11.2 ± 4.1</td>
<td>10.3 ± 4.1</td>
<td>2.06</td>
<td>0.15</td>
</tr>
<tr>
<td>Academic preparation</td>
<td>8.8 ± 3.7</td>
<td>8.3 ± 3.9</td>
<td>0.71</td>
<td>0.40</td>
</tr>
<tr>
<td>Career opportunity</td>
<td>13.0 ± 2.4</td>
<td>12.0 ± 2.9</td>
<td>5.30</td>
<td>0.02</td>
</tr>
<tr>
<td>Individual aspiration</td>
<td>12.7 ± 3.0</td>
<td>12.6 ± 2.6</td>
<td>0.037</td>
<td>0.85</td>
</tr>
<tr>
<td>Physical self-efficacy</td>
<td>11.8 ± 3.1</td>
<td>10.1 ± 4.3</td>
<td>7.18</td>
<td>0.008</td>
</tr>
</tbody>
</table>

Values are means ± SD; \(n = 58\) African-American students and 148 Caucasian students.

**Table 3. Multivariate ANOVA comparing perceived enrollment barrier scores between African-American and Caucasian students**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>African-American Students</th>
<th>Caucasian Students</th>
<th>F Value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social influence</td>
<td>11.9 ± 7.0</td>
<td>9.7 ± 4.4</td>
<td>6.22</td>
<td>0.01</td>
</tr>
<tr>
<td>Experiential opportunity</td>
<td>9.4 ± 4.5</td>
<td>7.6 ± 3.8</td>
<td>7.66</td>
<td>0.006</td>
</tr>
<tr>
<td>Academic preparation</td>
<td>6.6 ± 3.9</td>
<td>5.4 ± 3.0</td>
<td>5.58</td>
<td>0.02</td>
</tr>
<tr>
<td>Physical self-efficacy</td>
<td>5.8 ± 4.0</td>
<td>4.5 ± 2.9</td>
<td>5.89</td>
<td>0.02</td>
</tr>
<tr>
<td>Self-management</td>
<td>12.0 ± 5.7</td>
<td>11.7 ± 5.2</td>
<td>0.13</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Values are means ± SD; \(n = 50\) African-American students and 135 Caucasian students.
students pursue allied health education (36). Therefore, program leaders must ensure that marketing materials are distributed outside traditional K–12 settings.

**Physical self-efficacy.** This factor was considered more important among African-American students compared with Caucasian students. As defined by the SAHED, physical self-efficacy refers to three specific areas of self: athletic experience, performance in physical education, and success in sport (7). Stated differently, the perception of participating in high school sports and physical education classes (i.e., “physicality”) played a more important role in enrollment decision making among African-Americans than among Caucasians. According to Bandura (4), self-efficacy is a judgment regarding one’s ability to perform a behavior required to achieve a certain outcome. Self-efficacy here refers to the perceived ability to succeed in the allied health field. If people believe that they can accomplish something, they will become more inclined to do so and will feel more committed to their decision (5). Many prospective students are exposed to the allied health field through participation in sports. Students see athletic trainers and therapists during high school athletic experiences, and, based on Bandura’s description of self-efficacy, African-American students who perceive positive high school experiences in activity-based settings are likely to form a belief that they can be successful in allied health professions to which they are exposed.

**Social influence.** Social influence is defined by items such as program diversity and knowledge of the field (Table 1). Although the differences were not statistically significant in our study, African-American students ranked this factor as a greater enrollment influence than did Caucasian students. This finding highlights the need for programs to market integrated student opportunities. In addition to marketing diversity initiatives, programs must also provide on-campus exposure to allied health education. Generally speaking, a high knowledge level of the allied health field is associated with a high tendency toward program enrollment (25, 26). Several science-based curricula have implemented pipeline programs to increase the knowledge base of prospective K–12 students, and this intervention has certainly been underused in allied health education (17).

**Enrollment Barriers**

**Social influence.** Personal and social influences can be equally important enrollment influences or barriers. Whereas good role models and exposure to the field can be positive influences for some students, others without the same social support may find these same factors to be major barriers (13). The fact that African-American students considered social influence to be a bigger barrier to enrollment than did Caucasian students reinforces the importance of mentors to the former population. Kinesiology units clearly must target prospective African-American students through social influences. Teachers, coaches, and counselors all seem to be prospective mentors.

**Experiential opportunity.** This barrier factor was operationally defined as availability of role models in the field, access to part-time jobs in the field, access to job shadowing, and scholarships available for the major. African-American students perceived access to job training opportunities in the field to be a greater enrollment barrier than did Caucasian students. Baldwin and Agbo (2) reported that exposure to professionals in the allied health field is essential to career choice. Considering that many students may not be exposed to allied health through high school courses, this potential enrollment barrier becomes a greater concern for students entering college. In general, experiential opportunity has been identified as a distinguishing characteristic between students who enroll in allied health education programs and students who pursue other academic fields (6). Kinesiology program faculties must recognize that African-American students perceive the lack of experiential opportunity as a major enrollment barrier and therefore must be proactive identifying mentors in the field to encourage students to enroll.

In an effort to increase experiential opportunities for minority students, universities and colleges have implemented pipeline/career programs (17, 38), summer enrichment/bridge programs (1), and accelerated degree programs (31). Despite the increased minority enrollment resulting from some of these efforts, few kinesiology departments have modeled pipeline, academic enrichment, or secondary summer programs to recruit future minority applicants. With an allied health workforce shortage, part-time jobs and internships in the field will likely be available; however, African-American students in the present study certainly perceived opportunity as a major barrier. Programs, therefore, must be proactive in identifying and preparing minority students for these opportunities. In essence, kinesiology units must consider expanding experiential learning (e.g., field experiences and part-time jobs) to recruit more African-American students.

**Academic preparation.** This factor is consistent with barriers reported for various science-based programs (31). Kinesiology-based programs in allied health education do not necessarily offer open enrollment; therefore, students with unsatisfactory academic performance are unlikely to be accepted. The present findings reflect the greater importance that African-American students place on academic performance relative to enrollment decisions. This outcome should shape recruitment efforts of African-American students, given that it can provide a major obstacle to enrollment.

**Physical self-efficacy.** Just as perceived physicality was an important influence on enrollment, a perceived lack of physicality may be an impediment. African-American students clearly believed their physicality, regardless of direction, played a significantly more important role in their decision making than did Caucasian students. Again, this distinction supports the need to address this factor within marketing efforts of ethnically diverse students.

**Research Limitations**

A limitation in the present study was the exclusion of culture in the analysis. We simply analyzed results by race rather than exploring social or cultural influences on student groups. Future studies may want to match participants for racially important variables before comparing group differences. Additionally, this study examined students already enrolled in 2- or 4-yr allied health education degree programs within kinesiology units, and the low response rates from Hispanic and Native American students reflect the limited diversity in the field. Suggestions for future studies include examining perceived
Differences in enrollment influences and enrollment barriers among K–12 students. Understanding multiple levels of the student matriculation process will unquestionably help institutions target and recruit a more diverse student body.

Conclusions

We examined differences on allied health program enrollment influences and enrollment barriers between Caucasian and minority students within kinesiology units. African-American students perceived multiple influences to be more important to their enrollment decision compared with Caucasian students. African-American students also perceived greater barriers to enrollment in allied health education than did Caucasian students. These findings can assist kinesiology faculty and administrators with the development and refinement of minority student recruitment initiatives.

GRANTS

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DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

AUTHOR CONTRIBUTIONS

Author contributions: J.B. and J.Z. conception and design of research; J.B. performed experiments; J.B., E.T.L., J.Z., and G.C. interpreted results of experiments; J.B. and D.C. drafted manuscript; D.C. and J.Z. edited and revised manuscript; D.C., E.T.L., J.Z., and G.C. approved final version of manuscript; E.T.L. and G.C. analyzed data; G.C. prepared figures.

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