Hand Dynamometer and Push-Up Study (Scott Bradshaw EdD, Duane Crider PhD, Kristopher Geisinger M.S,CPT/GFI, Jeff Whitmoyer MBA, Michelle Vaughn PhD.)

Introduction

Students at Kutztown University, as in other universities across the country, participate in health and wellness fairs, health surveys, fitness initiatives, and wellness expositions.   These initiatives provide the students and researchers with information about student's fitness levels, health promotion information and peer into the behaviors and decision making of today's students.

College students involved in fitness, strength and conditioning, or personal wellness initiatives often ask "how strong am I", or "am I strong enough"? To answer these questions, fitness/sport management classes at Kutztown University have been participating in the health and wellness expositions held every semester and assessing student outcomes. Fitness Administration classes at Kutztown University train these sport management students with skills, tools and experiential opportunities to measure a client's strength through very simple and easily administered processes such as a Push-Up Test or the Hand Dynamometer Test.

The standard push-up has been traditionally used to develop not only muscular strength but also muscular endurance. Based upon the results of various studies, the Hand Dynamometer has been routinely administered to determine upper body strength and endurance.

The purpose of this current research was to review existing research related to the effectiveness of these two assessment tools and to further explore whether these tools, if effective, are also related, an investigation that does not appear to have been attempted through previous research.

Methods

The population assessed was college-aged males and females between the ages of 18-23. Student population/participation was (n=253). Each student was asked to volunteer to participate in both the Push-Up and Hand Dynamometer Assessments. All participants provided their permission as per IRB approved disclaimer and informed consent acknowledgment as per Kutztown IRB procedures.

Participation in the assessment was explained and supervised by students enrolled in the Kutztown University Sport Management/Fitness Administration Program or a faculty supervisor. The Maximum Push-Up Test was based on the correct technique while the Hand Dynamometer Test was based on a 3 second grip, attempted 3 times on both the dominant and

non-dominant hand. Descriptive statistics were used to analyze the data collected from the assessments.

Results

The descriptive results indicated that males possess greater upper body strength than females for both tests. These results are consistent with the literature on male/female strength differences. There was a strong statistical correlation for both male and female students, between being able to do more push-ups and having stronger grip in their dominant (stronger) hand (correlation was significant at .001; results .475). This shows a statistically strong and significant relationship. These findings should be researched in future studies.

Discussion/Conclusion

These findings reveal student strength is lacking. This simple assessment administered, through Sport Management/Fitness Programs could generate awareness of student's fitness limitations and encourage students to participate in activities to increase their strength.   Results are also very interesting and certainly warrant further research. Future research should also look at the newly implemented 2019 Military Push-Up Assessment versus the regular Push-Up and include a comparison of these findings to grip strength. Perhaps a longitudinal study to determine if students are gaining strength, with today's increasing focus on sedentary behavior.

Correlations

		Gender Code	Push-up	Highest	Age
Gender Code	Pearson Correlation	1	-.407**	-.688**	-.126*
	Sig. (2-tailed)		.000	.000	.045
	N	253	253	253	253
Push-up	Pearson Correlation	-.407**	1	.475**	.009
	Sig. (2-tailed)	.000		.000	.889
	N	253	253	253	253
Highest	Pearson Correlation	-.688**	.475**	1	.132*
	Sig. (2-tailed)	.000	.000		.036
	N	253	253	253	253
Age	Pearson Correlation	-.126*	.009	.132*	1
	Sig. (2-tailed)	.045	.889	.036	

	N	253	253	253	253

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Simple Scatter of Push-up by Highest
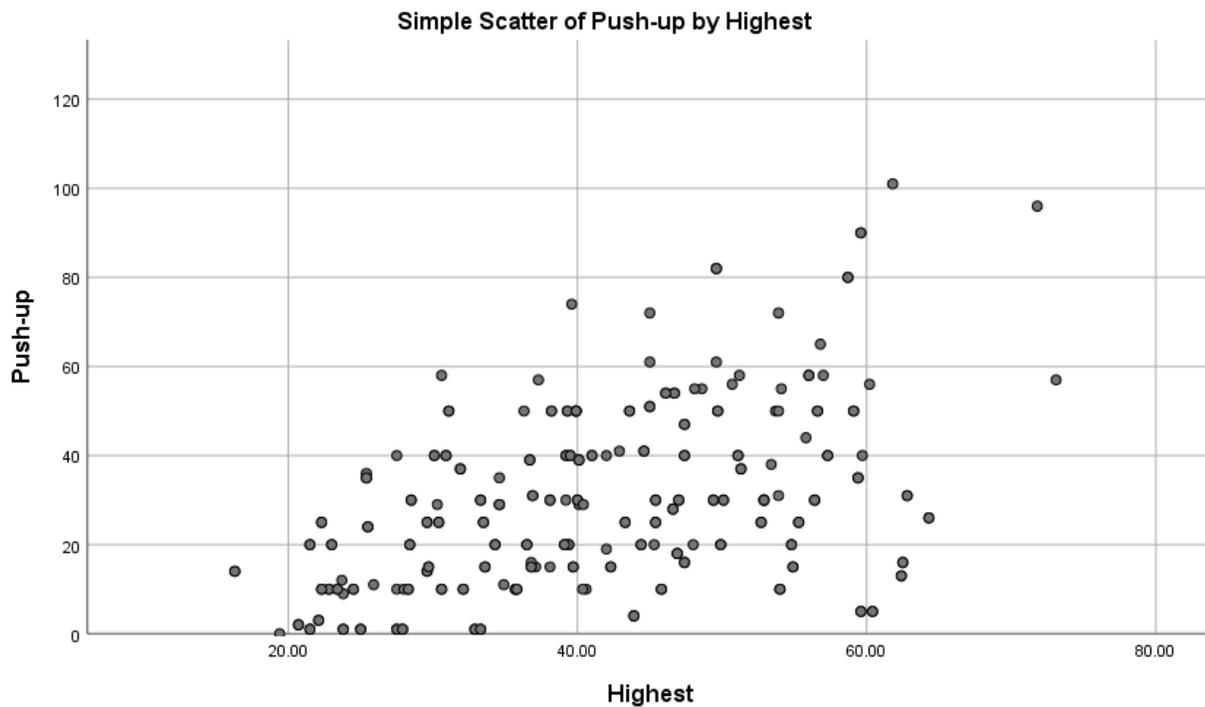
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