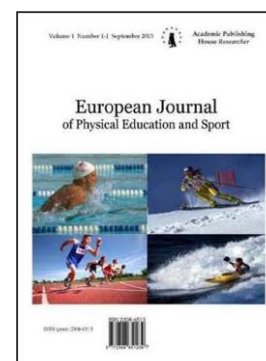


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## Exploring of Youth Volleyball Players' Engagement Motivations and Health Related Behaviors

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### Abstract

As Youth Olympic Summer Games becoming a global sports event in the year of 2010 and be held every four years, research studies demanding about youth volleyball players (YVPs) have become increasingly broader and deeper. The current study examined the essential factors that actually motivated YVPs engaging in practices and competitions and their health relate behaviors using the Adapted Youth Volleyball Players' Motivations and Health Relate Behaviors Questionnaire. Participants were 129 YVPs (age 15-18; 84 males, 45 females; 76 Chinese, 54 American). Data analysis was done by a 2 x 2 x 2 x 2 [Gender (male, female) x Supports (by parents, by-School) x Goal-settings (for-Professional, for-none-professional) x Countries (PRC, USA)] factorial multivariate analysis of variance (MANOVA). Findings including: the top three mean scores among the 19 Motivation factors (MFs) are: MF1 "Unique value"  $M = 4.379 \pm .792$ ; MF3 "Healthier body"  $M = 4.302 \pm .973$ ; RF11 "Foster self-esteem"  $M = 4.212 \pm .878$ ; the MANOVA revealed: 'Gender' and 'Goals-setting' did not reach significant different ( $p > .05$ ) level but the 'Supports' and 'Countries' did. The follow-up 2 x 2 MANOVA discovered: In 'Supports' aspect, 5 out of 19 comparisons showed significant differences ( $p < .05$ ) with 'support by-parents' over 'support by-school'. In 'Countries' aspect, four out of 19 comparisons reached significant differences ( $p < .05$ ) with Chinese YVPs over American YVPs. In conclusion, when examining the YVPs' motivations, 'Gender (male, female)' and 'Goal-settings (for-Professional, for none-professional)' are not the determinate aspects but 'Supports (by-parents, by-School)' and 'Countries (PRC, USA)' aspects are. The findings of this study added a set of fresh data and information regarding the essential MFs that truly motivated the YVPs engaging in practices and competitions, and unique features about these players' health relate behaviors. Meaningful analyses and suggestions are made for the international youth volleyball community that can be used for improving their teaching, coaching and management.

**Keywords:** youth sport, goal setting, support, practice, competition, coaching, management.

### 1. Introduction

The game of volleyball, originally was called "mintonette" and invented by William G. Morgan in 1895 at the Holyoke, Massachusetts, Young Men's Christian Association, USA; where he served as Director of Physical Education. At that time, Morgan's new design for the volleyball game was a combination of basketball, baseball, tennis, and handball (Bellis, 2013). The sport of

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volleyball is very magnificently balanced between power and speed. Hence while strength and height have become vital components of international teams, the ability of teams and coaches to devise new tactics, strategies and skills have been crucial for success at all significant volleyball competitions (Bellis, 2013). Volleyball game was designed play indoors and in controlled conditions. There are men and women's volleyball events. Volleyball matches should be played to the best of five sets. The first four sets are played to 25 points, with the final set being played to 15 points. A team must win a set by two points. There is no ceiling, so each set continues until one of the teams gains a two-point advantage (Ducksters, 2015; FIBV 2018).

Over the years, both male and female USA volleyball teams are always one of the best teams on the three major volleyball international competitions (including World Cup, World Championship and Olympic Game). USA men and women volleyball teams have won multiple titles in these three major international competitions (E.g., the 1984 Los Angeles Olympics, the 1988 Korea Olympics, the men's team won the gold, etc.). Today, there are more than 800 million volleyball players worldwide, with 46 million of them in the U.S. (Ducksters, 2015; FIBV 2018; Frank, 2015). For playing volleyball and their accomplishment, the Chinese men were not as good as their women sibling, the Chinese women volleyball team become one of the best volleyball teams on the earth since the 1980s; by far they have accomplish nine championships titles in all three major international competitions of volleyball, including World Cup four times (1981, 1985, 2003 and 2015), World Championship twice (1982, 1986) and Olympic Game titles three times (1984, 2004 and 2016) (Wikipedia, 2018).

As Youth Olympic Summer Games becoming a global sports event in the year of 2010 and been held every four years, research studies demanding about youth volleyball players (YVPs) have become increasingly broader and deeper (Official Report, 2010). Even though research literature in youth sports have pointed out that, the goals and reasons of engaging in youth sports practices and competitions including: 'enjoyment', 'physical health', 'having fun', 'foster self-esteem', 'friendship', 'passion or love the game', and 'peer acceptance', 'to contest winners', 'to become a coach', 'to satisfy family's will'; whereas the first three reasons are similar for those participate in the dominant recreational activities of Western societies (Claver et al., 2017; Devine, Lepisto, 2005; Smith et al., 2006; Wikipedia, 2018; Zeng, Meng, 2017). Moreover, Miguel and Machar (Miguel, Machar, 2007) indicted that motivation supports a successful sport performance; representing one of the most important psychological skills in the game he/she is playing. Based on those findings, we are concerning: whether or not nowadays YVPs engage in their practices and competitions really motivated by those factors/reasons (RFs) as been described above? Even despite this, the previous research studies in youth sports involved youth volleyball players' engagement motivations and health related behaviors were still extremely inadequate.

### 1.1 Purpose and Hypotheses

From the introduction and background in youth sports research above, although some of the reasons have been known in general, little is known, however, about what kinds of RFs that actually motivated those YVPs who actually engaged in practices and competitions. Therefore, the purpose of this study was: to explore and examine what RFs truly motivated the YVPs who continually engaged in volleyball practices and competitions. The following specific hypotheses guided our study: (a) no significant differences would be found on the motivation RFs between male and female participants; (b) no significant differences would be found on the motivation RFs between the participants who financially 'Support by-parents or by-school'; (c) no significant differences would be found on the motivation RFs between the participants who set their 'Goal for-professional or for-non-professional'; (d) no significant differences would be found on the motivation RFs between the participants who come from PRC (Peoples Republic of China) or USA. Additionally, what would be the features of health related behaviors on 'Eating habits', 'Nutrition knowledge and status', 'Risk behaviors', and 'Hygiene behaviors' of the participants? The findings from this research would reveal and add a fresh set of data and first-hand description into the youth athletes study literatures, especially concerning youth volleyball players' engagement motivations and their health related behaviors during their volleyball practices and competitions.

## 1.2. Theoretical Framework

A comprehensive theoretical framework named 'self-determination theory' (SDT) (Ryan, Deci, 2000) was employed as the theoretical frame of the current study. The SDT is consisted of two major branches: the theory of intrinsic motivation and the theory of extrinsic motivation. Ryan and Deci (Ryan, Deci, 2000) pointed out: humans are motivated by three basic psychological needs: competence, relatedness, and autonomy. The competence needs in the SDT model is called effectiveness motivation; the relatedness need refers to people's need to belong and to feel accepted by others; the autonomy need, however, refers to people's need to feel self-determined, which is the source of their own action (Ryan, Deci, 2000).

With regard to the organismic needs energize intrinsic and extrinsic motivations, Researchers had similar view: the concept of need in itself is too general and too vague to illustrate the engagement in particular behaviors; to guide empirical research is difficult as well. With this concern, researchers developed a few models describing how different motivations triggered by need manifest in intrinsic and extrinsic motivation in specific aspects or activities (Cox, 2011; Harter, 1981; Pintrich, Schunk, 2002). Stipek (Stipek, 1996) indicated that the research literature is quite consistent with regard to the benefits of intrinsic motivation to learning and development; that is, engagement based on intrinsic motivation does not need external incentives or rewarding and is able to enhance the motivations necessary to engage in the same activity again and again in the future. Kaplan (Kaplan, 2010) further illustrated that engagements based on intrinsic motivations are connected with enhanced comprehension, creativity, cognitive flexibility, accomplishment, and so on.

Additionally, Breese (Breese, 1998) clarified that athletics' initial motivation should be defined as intrinsic motivation (engage in sport for enjoyment) or extrinsic motivation (engage in sport to win rewards). Breese (Breese, 1998) further illustrated, athletics' initial motivation usually predicts athletes' attendance and adherence to a particular sport. Such as in the present study, a youth volleyball player who is intrinsically motivated would be those who go to play or practice his/her skills every other day for fun; whereas a volleyball player who is extrinsically motivated would be those who goes to practice his/her volleyball skills to become a better player at the competition so that he/she could win rewards at competitions. It is interesting to know that intrinsic and extrinsic motivation have different effects on an athlete; whether or not he/she continues the sport he/she had chosen.

Similarly, Researchers explained that individuals who were mainly motivated by competence (engaging in practices to improve skills) and enjoyment (desire to have fun and enjoyment) could be primarily defined as being motivated intrinsically. On the other hand, extrinsically motivated individuals are those behaviors performed in competitions aimed at obtaining rewards or consequences that are unconnected from the behavior itself (Ryan et al, 1997). More specifically, Breese (Breese, 1998) explained that, when athletes begin participation in a particular sport, they are motivated not only by intrinsic factors but also by extrinsic factors. Some particular sports, however, may be more dependent on *intrinsic motivation* than *extrinsic motivation* (Ryan, Deci, 2000). The reasons are: different types of sports need different types of motivation (Breese, 1998; Ryan et al., 1997). In the present study, we were trying to find evidences or factors that have actually motivated the youth athletes who have engaged in the sport of volleyball for numbers of years.

Additionally, in regard to how educators (coach or teacher) apply the "self determination theory" to enhance their coaching or teaching, researchers in their literature review indicated that: when certain important variation exists, there seems to be a widespread consensus between researchers and educators that enhancing intrinsic motivation among youth athletes is beneficial (Cox, 2011; Kaplan, 2010). Youth athletes' intrinsic motivation is enhanced when practices promote their sense of personal autonomy, team or schoolwork are challenging and relevant to them, social relationships are supportive, and environments are physically and psychologically safe (Cox, 2011; Kaplan, 2010). Likewise, practices that promote these environmental characteristics include providing youth athletes with choices among activities and between ways of completing tasks, encouraging youth athletes to explore and pursue their ambition, building on their backgrounds and prior experiences in constructing tasks, encouraging them to collaborate, incorporating fantasy in activities, providing feedback that is informative and frequent, and reducing external rewards (Kaplan, 2010).

Similarly, in many cases, youth athletes are required to engage in tasks that they are not motivated in or not understand why they have to do. Under such circumstances the extrinsic motivations should be implemented to those tasks. However, coaches / teachers should pursue the internalization of youth athletes' extrinsic motivation for these tasks, this can be supported by providing specified examples or demonstrations; coaches should make the value of the tasks explicit and clear (Harter, 1981).

## 2. Methodology

The participants in the current study were purposefully selected from fourteen high schools wherein eight were selected from the city of Nanjing, PRC and six were selected from New York City, USA. All schools selected are public school and had a volleyball varsity team and took part in citywide high school volleyball competition (or championship) regularly (Chinese Middle School Sports Association, 2017; Pintrich, Schunk, 2002).

### 2.1 The Instrumentation

The Adapted Volleyball Player's Motivation and Health Related Behaviors Questionnaire (AYVPMHRBQ) was employed for data collection (Zeng, Meng, 2017). The reasons for using this instrument were: a) an existing questionnaire with similar purposes is available; b) to develop a new questionnaire, time and funding are needed; c) specialists in youth players' motivation and health-related behaviors study are available to revise the wordings to fit in using for youth volleyball players; and d) research assistants and youth volleyball coaches are available for distributing and collecting the questionnaires.

As a result, the AYVPMHRBQ (Zeng, Meng, 2017) contained three parts: Part I requested 'General Information', containing eight questions that covered participant's general information. Part II examined, "What reasons/factors motivated you engaging in volleyball practices and competitions continually" with 19 reasons/factors (RFs) provided. For each RF, the participants can respond to a 5-points *Likert-type scale* (5-points represents "Very strong fit", 4-points represents "Strong fit", 3-points represents "Fit", 2-points represents "Somewhat-fit" and 1-points represents "Little-fit"). In short, Part II of the questionnaire contains ten intrinsic motivation factors (items 1, 2, 4, 7, 8, 10, 13, 14, 15, and 17) and nine extrinsic motivation factors (items 3, 5, 6, 9, 11, 12, 16, 18, and 19). In other words, it included the three basic psychological needs (competence, relatedness, and autonomy) that were described by Ryan and Deci (Ryan, Deci, 2000).

Part III checked 27 health related behaviors that were under the following four sub-categories: 'Eating habits', 'Nutrition Knowledge and Status', 'Risk Behavior', and 'Hygiene Behaviours'. To be clearer, these 27 health-related questions or behaviors are belonging to qualitative data, hence, the data were recorded employed frequency and percentage.

All questions or items in the AYVPMHRBQ (Zeng, Meng, 2017) can be found in Table 2, Table 5 and the Appendix A\*. (\*The AYVPMHRBQ has English and Chinese versions, the YVPs from PRC were given the Chinese version. Due to words limitation, Appendix A has been omitted).

### 2.2 Data Collection

The questionnaires were distributed to the participants during a planned practice day of their team by the researchers under the supervision of their coach or administrators. The participants were given their rights to participate or not to participate and the 'confidentiality' of the survey was also well informed. An explanation about how to respond to the questions or the items was also given; then, an envelope for preventing the participant's coach or instructor from viewing how he/she responds to the questionnaires was provided. By this moment, the participants were asked to sign the Informed Consent Form and submitted it back to the researchers. The researchers also informed coaches that, after the study being completed, the overall outcomes of this study would be provided to their teams. As a result, among the 180 questionnaires delivered, 129 were correctly completed and returned to the researchers (return rate = 71.67 %).

### 2.3 Research Design and Data Analyze

The research design and data analyses for this study were: first, to look at the effects of four independent variables on 19 dependent variables, which are 'Gender' (Male, Female), 'Supports' (by-parents, by-school), 'Goal-settings' (for-professional, for-non-professional), and 'Countries' (PRC, USA) at the same time. Therefore, a 2 x 2 x 2 x 2 MANOVA test was employed. The descriptive statistics reflected the general effects of how these participants were motivated to

engage in volleyball practices and competition; and after significant difference findings a follow-up MANOVA test aim at examining where/what differences really exist among the independent variables with related to the 19 dependent variables (Child, 1990). The statistical program SPSS 24.0 was used for the data analysis and processing.

On the other hand, regard to participants' health related behaviors; the Part III of the questionnaire was employed. With a total of 27 questions / behaviors included 'Eating habits', 'Nutrition Knowledge and Status', 'Risk Behaviours', and 'Hygiene Behaviors' four sub areas. Because of the structures and characteristics of these questions / behaviors, frequency and percentage methods were utilized for data analyzing (Child, 1990). The results from this part of investigation were aimed at reflecting the participants' current status of health-related behaviors.

### 3. Results

#### 3.1. Participants' General Information

The following section presents the findings from the current study; all findings were summarized in Table 1 to Table 5. It aims at discover what reasons/factors actually motivated these youth volleyball players to engage the sport; and at reveal their health related behaviors status as well. First, among the 180 questionnaires distributed, 129 were completed correctly and returned to the researchers; that was about 72 percent return rate. Second, data in Table 1 reflected "General Information of the participants". For example: the participants self-reported: heir heights were "for Male = 179 ( $\pm$  11.5) CM" and "for female = 166 ( $\pm$  8.5) CM". They have been officially engaged in volleyball practices and competitions for 1 to 4 years with the "three year = 68 / 52.7 %" as the highest frequency and percentage. They were all current high school students.

It is worth to illustrate that: the YVPs from the PRC high school volleyball varsity teams represent the highest skill and competitive capability in the youth competitive sport system of the PRC. These YVPs in PRC practice five afternoons per week with 120 -150 minutes per section. Morning exercise may be added in depending on different seasons, times of practices for each section may vary (30-40 minutes). Their program goals are: to promote physical education in schools, promote the development of physical education in secondary schools, increase the sport skills and mental health, and strive to cultivate moral, intellectual, physical, and aesthetic standards. Such as all-round development of outstanding sports reserve talents (Chinese Middle School Sports Association, 2017).

The YVPs in USA high school volleyball varsity teams are definitely represent the highest skill and competitive capability in their youth volleyball competitive sport system. Similarly, the YVPs in USA have five afternoon practices per week as well; but the times for each practice section might slightly shorter than those of YVPs from PRC. Their program goals are: "Encourage as many students as possible to participate in athletic games; Promote sportsmanlike conduct in all athletic contests; Maintain essential minimum standards of eligibility; Provide means to settle disputed athletic contests amicably and authoritatively; Conduct appropriate athletic meets and tournaments; cooperate with the State Education Department in fostering educationally sound athletic programs; Adapt rules governing sports contests to the particular conditions governing high school competition; Continually seek data to support rule changes leading to greater safety for high school athletes" (Miguel, Machar, 2007; Pintrich, Schunk, 2002).

Table 1 reflected the general information about the participants of this study:

**Table 1.** Summery of General Information about the Participants ( $N = 129$ , ages = 15-18, 84 male, 45 female, 76 from PRC, 53 from USA)

Number / Questions	Answers / Frequency / Percentage
1. What is your gender?	a) Male = 84 / 65.1% b) Female = 45 / 34.9%
2. What grade level are you currently going to?	a) 9 – 10 grades = 49 / 37.98% b) 11-12 = 80 / 62.02%
3. How long have you officially play volleball?	a) One year = 15 / 11.6% b) Two years = 31 / 24% c) Three year = 68 / 52.7% d) Four years = 15 / 11.6%
4. What is your Height (CM)?	

- a) Mean for Male = 179 ± 11.5 CM    b) Mean for Female = 166 ± 8.5 CM
5. What is your Weight (KG)?  
 a) Mean for Male = 65 ± 9.5 KG    b) Mean for Female = 59 ± 11.5 KG
6. What is your age-range?    a) 15-16 = 52 / 40.31%    b) 17-18 = 77 / 59.69%
7. Financially, who supported you engaged in volleyball practices and competitions?  
 a) By my parents = 59 / 45.7%    b) By my school /team = 70 / 54.3%
8. What is your goal of engaging in volleyball practices and competitions?  
 a) For become a competitive volleyball player = 50 / 38.3%  
 b) For play better volleyball but not a competitive volleyball player = 79 / 61.2%

The means score and the standard deviations were presented in [Table 2](#):

**Table 2.** Motivation factors (MF) that motivated the youth volleyball Players: Mean scores and standard deviations (S.D.) ( $N = 129$ , Ages = 15-18, 84 Male, 45 Female, 76 from PRC, 53 from USA)

Motivation Factors (MF)	Mean ± S.D.	Sum	Rank
MF 1 Because volleyball's high technical content and unique value.	4.379 ± .792	565.000	1
MF 2 For the fun and get rid of boredom.	4.186 ± .982	540.000	6
MF 3 For getting healthier whole body	4.302 ± .973	555.000	2
MF 4 For the enjoyment and have happiness.	4.209 ± .844	543.000	4
MF 5 In order to meet my friends.	4.108 ± .877	530.000	8
MF 6 In order to make new friends.	4.069 ± .999	525.000	10
MF 7 In order to contest winners.	4.069 ± .911	525.000	9
MF 8 In order to shape the body.	3.465 ± 1.268	447.000	16
MF 9 In order to improve physical health.	4.139 ± 1.137	534.000	7
MF 10 For the near future may become a professional player.	4.194 ± .984	541.000	5
MF 11 In order to foster self-esteem.	4.212 ± .878	542.000	3
MF 12 In order to improve my own reputation	4.008 ± 1.121	517.000	13
MF 13 In order to establish prestige among my friends.	4.069 ± 1.169	525.000	11
MF 14 In order to get the recognition from my teacher / coach.	4.031 ± 1.082	520.000	12
MF 15 In order to reduce the learning / working pressure.	4.000 ± 1.118	516.000	14
MF 16 In order to reduce the troubles from learning / work.	3.969 ± 1.052	512.000	15
MF 17 In order to develop a unique sport skills.	3.170 ± 1.193	409.000	18
MF 18 Hope to become a volleyball coach in the future.	3.147 ± 1.317	406.000	19
MF 19 In order to satisfy the will of family.	3.256 ± 1.106	420.000	17

**Note.** a) The motivation factor (MF) 1, 2, 4, 7, 8, 10, 13, 14, 15, and 17 are 'Intrinsic motivation factors'; b) the MF 3, 5, 6, 9, 11, 12, 16, 18, and 19 are 'Extrinsic motivation factors'

The results of the 2 x 2 x 2 MANOVA for comparing the motivations factors / reasons for the youth volleyball athletes' were presented in [Table 3](#):

**Table 3.** The 2 Gender (male Vs. Female) x 2 Supports (*by-parents vs. by-school*) x 2 Goal-Settings (*for professional vs. for non-professional*) x 2 Countries (PRC vs. USA) factorial multivariate analysis of variance (MANOVA) Tests for youth volleyball players' motivation factors ( $N = 129$ , Ages = 15-18, 84 Male, 45 Female, 76 from PRC, 53 from USA)

Source	Wilks' Lambda	F	Hypo df	Error df	P
Gender	.762	1.591	19.000	97.000	.074

Supports	.731	1.880 <sup>b</sup>	19.000	97.000	.024
Goals	.799	1.281 <sup>b</sup>	19.000	97.000	.214
Countries	.741	1.781 <sup>b</sup>	19.000	97.000	.036

**Note.** 1) Show only for those sources < than 0.5 level; 2) <sup>a</sup> Design: Intercept + Gender + Supports + Goals + Countries + Gender \* Supports + Gender \* Goals + Gender \* Countries; 3) <sup>b</sup> Exact statistic. 4) Supports (*by-parents*,  $n = 59$  vs. *by-school*  $n = 70$ ); 3) Goal-Settings (*for professional*  $n = 50$  vs. *for non-professional*  $n = 79$ ); and Countries (PRC  $n = 76$  vs. USA  $n = 53$ ).

The results in Table 3 showed that: no significant difference in the ‘Gender’ ( $p > .05$ ,  $\Lambda = .762$ ,  $F = 1.591$ ), and no significant difference in the ‘Goal- settings’ ( $p > .05$ ,  $\Lambda = .799$ ,  $F = 1.281$ ); however, significant differences did exist in ‘Supports’ ( $p < .05$ ),  $\Lambda = .731$ ,  $F = 1.880$ , and significant differences did exist in ‘Countries’ ( $p < .05$ ,  $\Lambda = .741$ ,  $F = 1.781$ ) as well. According to the research design, after significant differences effects were found, a following up MANOVA test would be conducted. This post hoc test determined where and what motivation factors that truly motivated these participants engaged in volleyball practices and competitions.

**Table 4.** Descriptive statistics of youth volleyball players’ motivation factors (MF) after significant differences was found in ‘Supports’ and ‘Countries aspects’ ( $N = 129$ , Ages = 15-18, 84 Male, 45 Female)

M F	Supports-by Mean (SD)		Countries Mean (SD)	
	Parents ( $n = 59$ )	School ( $n = 70$ )	PRC ( $n = 76$ )	USA ( $n = 53$ )
MF1.	4.373 ± .807	4.387 ± .785	4.342 ± .809	4.434 ± .772
MF2.	4.186 ± 1.058	4.185 ± .921	4.171 ± 1.050	4.207 ± .884
MF3.	4.457 ± .896	4.171 ± .807	4.434 ± .854	4.113 ± 1.103 *
MF4.	4.254 ± .882	4.171 ± .815	4.210 ± .868	4.207 ± .817
MF5.	4.254 ± .821	3.985 ± .908	4.144 ± .843	4.056 ± .928
MF6.	4.271 ± .925	3.900 ± 1.051	4.220 ± .852	3.942 ± .940
MF7.	4.220 ± .852	3.942 ± .946	4.065 ± .928	4.075 ± .895
MF8.	4.118 ± .948	2.914 ± 1.248 **	3.407 ± 1.297	3.547 ± 1.233
MF9.	4.186 ± 1.106	4.100 ± 1.169	4.210 ± 1.106	4.037 ± 1.239
MF10.	4.271 ± .867	4.128 ± 1.075	4.263 ± .943	4.094 ± 1.042
MF11.	4.389 ± .743	4.043 ± .954	4.276 ± .809	4.064 ± .966 *
MF12.	4.203 ± 1.046	3.842 ± 1.162 *	4.026 ± 1.082	3.981 ± 1.184
MF13.	4.220 ± .966	3.943 ± 1.047	4.026 ± 1.045	4.132 ± .981
MF14.	4.254 ± 1.043	3.842 ± 1.085	3.960 ± 1.136	4.132 ± 1.000
MF15.	4.271 ± .943	3.771 ± 1.205 *	4.019 ± 1.113	4.000 ± 1.135
MF16.	4.254 ± .957	3.728 ± 1.075 *	4.039 ± 1.038	3.837 ± 1.074 *
MF17.	3.220 ± 1.327	3.128 ± 1.076	3.210 ± 1.214	3.113 ± 1.171
MF18.	3.339 ± 1.409	2.985 ± 1.221	3.184 ± 1.303	3.094 ± 1.348
MF19.	3.508 ± 1.072	3.042 ± 1.095 *	3.302 ± 1.006	3.188 ± 1.241 *

**Note.** a) MF = Motivation Factor. b) This was the follow up test to determine what MF and which ‘Supports-by’ and ‘Countries’ exist significant differences. As results, in ‘Supports-by’ aspect, 5 out of 19 comparisons showed significant differences at significant  $p < .05$ \*Level; in which one comparisons reached significant  $p < .01$ \*\* Level. Second, in ‘Countries’ aspect, four out of 19 comparisons reached significant differences at  $p < .05$ \*Level only

Data in Table 4 were from the follow up test, it determined where/what RFs really had differences and reflected the “Factors that truly motivated the youth volleyball players be initially engaged in, and continually engaged in volleyball practices and competitions”.

Major findings: As showed on Table 2, the highest score factors were the following six MFs: MF1 ‘Technical content & unique value’ ( $M = 4.212 \pm .878$ ); MF3 ‘Healthier body’ ( $M = 4.302 \pm .973$ ); MF11 ‘Foster self-esteem’ ( $M = 4.352 \pm 1.114$ ); MF4 ‘For enjoyments’ ( $M = 4.209 \pm .844$ ); MF10 ‘To become a professional-player’ ( $M = 4.194 \pm .984$ ); and MF2 ‘For having fun’ ( $M = 4.186$

$\pm .982$ ), These six factors possessed the highest impact power on these youth volleyball player's motivations. The bottom seven factors' mean score were: MF12 'To improve reputation' ( $M = 4.008 \pm 1.121$ ); MF15 'To reduce pressure' ( $M = 4.000 \pm 1.118$ ); MF16 'To reduce the troubles' ( $M = 3.969 \pm 1.052$ ); MF8 'To shape body' ( $M = 3.465 \pm 1.268$ ), MF19 'To satisfy family's will' ( $M = 3.256 \pm 1.106$ ), MF17 'To develop a unique sport skills' ( $M = 3.170 \pm 1.193$ ); and MF18 'to become a volleyball coach' ( $M = 3.147 \pm 1.317$ ). These seven factors possessed less or lowest impact power on these youth volleyball players' motivations. The other six factors' mean scores were located the medium level. These MFs were: MF9 'To improve physical health' ( $M = 4.139 \pm 1.137$ ); MF5 'To meet friends' ( $M = 4.108 \pm .877$ ); MF7 'To contest winners' ( $M = 4.069 \pm .911$ ); MF6 'To make new friends' ( $M = 4.069 \pm .999$ ); MF13 'To establish prestige' ( $M = 4.069 \pm 1.169$ ); and MF14 'To get recognitions' ( $M = 4.031 \pm 1.082$ ). These six factors possess medium impact power on these youth volleyball athletes' participation motivations.

The findings from the Part III of the AYSAMHRBQ (Zeng, Meng, 2017) were summarized in Table 5:

**Table 5.** Summarize of youth volleyball players' health-related behaviors in the Part III of the questionnaire ( $N = 129$ , Ages = 15-18, 84 Male, 45 Female, 76 from PRC, 53 from USA).

Sub-category one. The 'Eating habits' (6)

1. Do you eat regularly?
  - a) My eating is very regular (67 / 51.94%)
  - b) My eating is regular (43 / 33.33%)
  - c) My eating is unregularly (11 / 8.53%)
  - d) My eating is very unregularly (8 / 6.20%)
2. How many meals do you eat a day?
  - a) Less than 3 times per day (0 / 0%)
  - b) 3 times per day (112 / 86.82%)
  - c) 4-5 times per day (9 / 6.97%)
  - d) Others (8 / 6.20%)
3. Do you add salt to your dishes?
  - a) yes, always (19 / 14.73%)
  - b) sometimes, yes (25 / 19.78%)
  - c) sometimes - no (54 / 41.86%)
  - d) no, I don't (31 / 24.03%)
4. Do you try to cut down on the amount of sugars you eat?
  - a) yes (15 / 11.62%)
  - b) sometimes - yes (45 / 34.88%)
  - c) sometimes - no (45 / 34.88%)
  - d) no, I don't (24 / 18.60%)
5. How many glasses of milk or dairy products (yoghurt, juice) do you drink per day?
  - a) 1-2 cups (67 / 51.93%)
  - b) 3-4 cups (35 / 21.13%)
  - c) more than 5 cups (21 / 16.28%)
  - d) I don't drink milk (6 / 4.65%)
6. Do you dine before and after strenuous exercise?
  - a) Yes (0 / 0%)
  - b) sometimes I do (0 / 0%)
  - c) I occasionally do (7 / 5.43%)
  - d) I never do so (122 / 94.57%)

Sub-category two. The 'Nutrition knowledge and status' (8)

7. How is your knowledge status about nutrition?
  - a) Very good 69 / 53.49%
  - b) good (25 / 19.78%)
  - c) Ordinary (31 / 24.03%)
  - d) Not so good (4 / 3.10%)
8. How often do you eat fruit?
  - a) once per day (58 / 44.96%)
  - b) twice per day (48 / 37.21%)
  - c) more than three times per day (17 / 13.18%)
  - d) Once every other day (6 / 4.65%)
9. How often do you eat vegetables?
  - a) once per day (15 / 11.63%)
  - b) twice per day (89 / 68.99%)
  - c) more than three times per day (15 / 11.63%)
  - d) Once every other day (10 / 7.75%)
10. How often do you eat fish?
  - a) once per day (8 / 6.01%)
  - b) twice per day (8 / 6.01%)
  - c) more than three times per day (0 / 0%)
  - d) Once every other day (113 / 87.59%)
11. Do you eat wholemeal bread?
  - Yes: a) once per day (61 / 47.28%)
  - b) twice per day (28 / 21.70%)
  - c) more than three times per day (0 / 0%)
  - d) Once every other day (40 / 31.01%)
12. How many times do you eat dinner with meat in a week?
  - a) 1-2 times (8 / 6.01%)
  - b) 3-4 times (45 / 34.88%)



- c) more than 4 times (8 / 6.01%)  
 13. What is your favourite meat?  
 a) Chicken (42/ 32.56%)  
 c) Veal / Calf (39 / 30.23%)  
 14. Do you eat fried foods?  
 a) Occasionally eat (67 / 51,94%)  
 c) Yes I like eat fried foods (6 / 4.65%)  
Sub-category three. The 'Risk behaviour' (5)  
 15. How often do you drink alcohol?  
 a) Never (8 / 6.20%)  
 c) once in a while (89 / 68.99%)  
 16. Do you smoke cigarettes?  
 a) Never (71 / 50.04%)  
 c) once in a while (18 / 13.95%)  
 17. Do you use any psychoactive substances?  
 a) Never (129/ 100%)  
 c) once in a while (0 / 0%)  
 18. Did you use anabolic steroid?  
 a) Never (129 / 100%)  
 c) once in a while (0 / 0%)  
 19. Do you know what health consequences to applying prohibited anabolic steroid or different kind of doping substances?  
 a) yes, I know them well (76 / 58.91%)  
 c) No, I am not sure (16 / 12.40%)  
Sub-category four. The 'Hygiene behaviours' (8)  
 20. Do you use sun cream when you play volleyball?  
 a) Never (115 / 89.15%)  
 c) once in a while (0 / 0%)  
 21. Do you take a shower after practicing or competition?  
 a) Yes, of cause I do (121 / 93.80%)  
 c) Mostof time I do (0 / 0%)  
 22. How often do you wash your hands daily?  
 a) One time (0 / %)  
 c) Before every meal (52 / 40 /31%)  
 23. How often do you brush your teeth daily?  
 a) Once per day (0 / 0%)  
 c) Three times per day (26 / 2..16%)  
 24. Do you use extra hygiene mouth?  
 Yes! – circle the things you used:  
 a) Dentist's threads (38/ 29.46%)  
 c) Dental floss (13 / 10.07%)  
 25. After a intensive practice, how was the quality of your sleep?  
 a) Very good (58 / 38.75%)  
 c) Normal (28/ 21.70%)  
 26. After a intensive competition, how is the quality of your sleep?  
 a) Very good (51 / 39.53%)  
 c) Normal (20 / 15.50%)  
 27. When sweating, do you drink water or beverages immediately?  
 a) Yes, I drink water immediately (103/ 79.84%)  
 c) I drink beverages immediately (26 / 20.15%)  
 b) every day in a week (68 / 52,71%)  
 b) Pork (41 / 31.78%)  
 d) Mutton / Lamb (7 / 5.43%)  
 b) Sometimes eat (36 / 27,91%)  
 d) No, I do not eat fried food (10 / 7,75%)  
 b) seldom (15 / 11.63%)  
 d) whenever have a reason (17 / 13.18%)  
 b) seldom (9 / 6,97%)  
 d) whenever have a reason (31 / 24.03%)  
 b) seldom (0 / 0%)  
 d) whenever have a reason (0 / 0%)  
 b) seldom (0 / 0%)  
 d) whenever have a reason (0 / 0%)  
 b) Yes, I know some of them (30 / 23.25%)  
 d) No, I don't know them at all (7 / 5.43%)  
 b) seldom (0 / 0%)  
 d) whenever have a reason (14 / 10.85%)  
 b) No, (18 / 6.20%), just want to go home ASAP.  
 d) No, because I do not want to (0 / 0%)  
 b) Two to three times (56 / 43.41%)  
 d) Whenever it is need to (11 / 8.53%)  
 b) Twice per day (103/ 79.84%)  
 d) Never (0 / %)  
 b) Teeth Liquids to rinsing (78 / 60.46%)  
 d) No, I never use extra hygiene mouth (0 / %)  
 b) Good (39 / 30.23%)  
 d) Not so good 4 / 3.10%)  
 b) Good (49 / 37.98%)  
 d) Not so good (9 / 6.97%)  
 b) I don't drink any of them immediately (0 / 0%)  
 d) I drink water but not immediately (0 / 0%)

Data presented in [Table 5](#) reflected the unique features and current status of these youth volleyball athletes' health-related behaviors. We believe that these four sub-categories of health-related behaviors are very important to the youth volleyball players and possess a positive

relationship with their successful rate. That is, the better their health-related behaviors, the higher success rate for them to become elite volleyball athletes. Furthermore, from an educational perspective, coaches / teachers / administrators who work for the youth volleyball teams should educate their players / students to gradually develop these positive health related behaviors, so that they can gradually develop or form those health related behaviors. Besides, the following were the significant highline:

A. For the 'Eating habits' sub-category: 1) 52 % of them reported their eating very regularly, only 6 % of them claimed their eating not so normal or regularly; 2) 87 % of them ate 3 meals per day; 3) about 66 % of them no need to add salt to their food / dishes but 34 % of them need to; 4) about 47 % of them did try to reduce the amount of sugars they eat; 5) 73 % of them drink 1-4 cups of milk / yoghurt / juice per day but about 5 % of them did not drink milk / yoghurt / juice; and 6) 95% of them reported they never dine before and after strenuous exercise.

B. For the 'Nutrition knowledge and status' sub-category: 7) 83 % of them reported they possess good to very good nutrition knowledge; 8) 95 % of them said they eat fruit every day; 9) 92 % of them said they eat vegetables every day, 10) 88 % of them reported they ate fish once every other day; 11) 100 % of them reported they eat whole meal bread; 12) 53 % of them reported they eat dinner with meat every day but 6 % of them claimed they eat dinner with meat only 1-2 times per week; 13) as to their favorite meat, the rank order was: Chicken, Veal / Calf, pork, then Mutton / Lamb (with about 5 % of them only); 14) 8 % of them reported they did not eat fried foods.

C. For the 'Risk behavior' sub-category, 15) 6 % of them said they never drink alcohol, 12 % of them reported they seldom drink alcohol, 69 % of them admired they once in a while drink alcohol, and about 13 % of them admired they drink alcohol whenever have a reason; 16) to 19), no need to highline (see [Table 5](#)).

D. For the 'Hygiene behaviors' sub-category, 20) 89 % of them claimed they never use sun cream when they play volleyball (because volleyball is an in-door sport)); 21) 94 % of them said they take a shower after practicing or competition; 22) 100 % of them claimed they wash their hands often or whenever it is needed to; 23) 100 % of them claimed they brush their teeth twice to three times per day; 24) 100 % of them claimed they use extra hygiene mouth, wherein 60 % of them used teeth liquids rinsing, 30 % used dentist's threads, and 10 % used dental floss; 25) 39 % of them claimed they had very good sleep after a intensive practice but 3 % of them said their sleep was not so good; 26) 51 % of them reported their sleep was very good after a intensive competition/game but 7 % of them claimed their sleep was not so good; and 27) 80 % of them said that whenever sweating they drink water immediately and 20 % of them reported whenever sweating they drink beverages immediately.

#### 4. Discussion

The current study was designed for: 1) exploring the current status and features of the YVPs' engagement motivations and their health related behaviors; and 2) examining if differences exist on the motivation factors between the participants' 'Gender (male vs. female)', 'Supports (by-parents vs. by-school)', 'Goal-settings (for-professional vs. for non-professional) and 'Countries (PRC vs. USA)' four aspects.

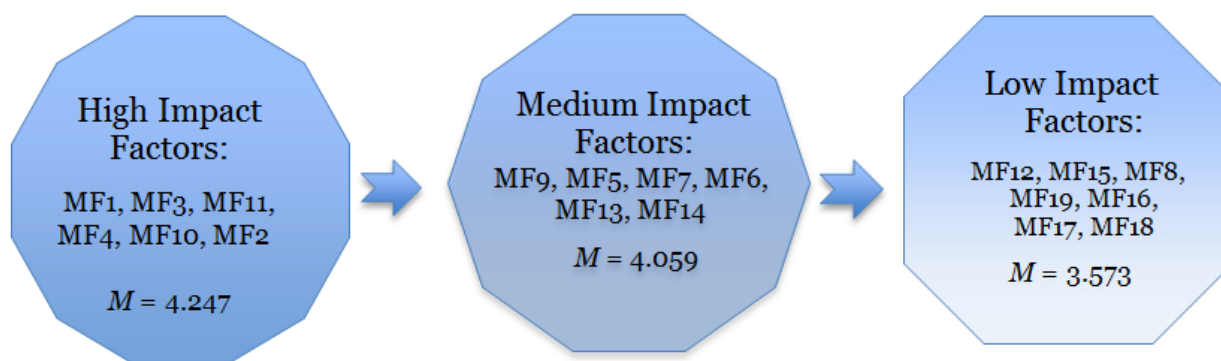
First, for the "current status and features", according to the data displayed in Table 2, the scores places can be divided into three groups and reflected the current status and features of these participants engagement motivations and their health related behaviors: The high impact factors group, containing MF1, MF3, M11, MF4, MF10 and MF2 possessed the highest score and impact power on this sample's youth volleyball players' motivation. Interestingly, among these six MFs, the MF1, MF4, MF10, and MF2 are in 'Intrinsic factors' category, while the MF3 and M11 are in 'Extrinsic factors' category.

The medium impact factors group with medium high scores, including MF9, MF5, MF7, MF6, M13 and MF14 possessed medium impact power on this sample's youth volleyball players' motivation. Even more Interesting, among these six MFs in this group there are three MFs are in the 'Intrinsic factors' category (MF7, MF13, MF14), and three MFs are belong to the 'Extrinsic factors' category (MF9, MF5, MF6).

The lower impact factors group, containing MF12, MF15, MF8, MF19, MF16, MF17, and MF18 possessed significantly lower impact power on these participants' motivations. Incredibly,

there are three MFs in the ‘Intrinsic factors’ category (MF15, MF8, and MF17), while four MFs are in the ‘Extrinsic factors’ category (MF12, MF19, MF16, and MF18, see [Table 2](#)).

In summary, 1) with regard to this sample’s participants’ motivation features, the ‘Intrinsic factors’ possess higher impact power than those of ‘Extrinsic factors’ on the participants’ motivations; 2) the ten ‘Intrinsic factors’ from the AYSAMHRBQ ([Zeng, Meng, 2017](#)) were the core motivation factors for the participants; 3) some factors or reasons possessed higher impact power than the other factors, and 4) there are also some factors or reasons held less impact power than the others factors. Based on our findings, youth volleyball coaches, trainers or administrators should diagnose and analyze their players’ specific situation and carefully implement the findings accordingly. The motivation features of this sample’ youth volleyball athletes can be summarized as [Figure 1](#).



**Fig. 1.** Motivation features of the participants ( $N = 129$ , Ages = 15-18, 84 Male, 45 Female, 76 from PRC, 53 from USA)

**Note.** a) The motivation factor (MF) 1, 2, 4, 7, 8, 10, 13, 14, 15, and 17 are ‘Intrinsic motivation factors’; b) the MF 3, 5, 6, 9, 11, 12, 16, 18, and 19 are ‘Extrinsic motivation factors’; c) The grand mean for all three groups =  $M_{\text{Grand}} = 3.960$ , and d) These 19 factors reflected the ‘Competence Needs’, the ‘Relatedness Needs’ and the ‘Autonomy Need’ in the ‘Self-Determination Theory’ model interpreted by Ryan and Deci (2000).

Second, for “the examining if differences exist on the motivation factors among the four independence variables (‘Gender’, ‘Supports’, ‘Goal-settings’ and ‘Countries’) or for the four specific hypotheses, the findings revealed: the first and third hypotheses were true. That were: no significant differences on the motivation factors between male and female volleyball players; and no significant differences on the motivation factors between the volleyball players who set-up a goal ‘for-professional’ or ‘for non-professional’. Although no one can exactly tell what the reasons behind of these are: it probably relates to these high school boys and girls are focusing on their two needs: one is academic learning, and the other one is to develop a unique skill. Play in a volleyball varsity team can satisfy these two needs for those teenagers no matter they are boys or girls. Likewise, it doesn’t matter what goals he or she has set-up (for-professional vs. for non-professional), the reality was he or she has been playing in a varsity team that would be beneficial for his or her future, and so on. In other word, the reaction / responding to the 19 motivation factors by the boys and girls in the two ‘Goal-settings’ (for-professional or for non-professional) were pretty similar, and reflecting they were training by amateur coaches, with similar coaching ideas, management regulations and a common goal; that was, to able to win the competition in a incoming citywide or state wide youth volleyball games ([Chinese Middle School..., 2017](#); [New York State..., 2017](#)).

The second and the fourth hypotheses, however, were not true. That were, participants’ motivations scores did exist significant differences between financially ‘Support by-parents’ or ‘Support by-school’; and the motivations scores between the participants who come from PRC or USA did exist significant differences as well. Furthermore, the following up 2 ‘Supports (by-parents, by-school)’ x 2 ‘Countries’ (PRC, USA) MANOVA test determined where and what MFs that truly motivated these participants engaged in volleyball practices and competitions.

The particular findings were: 1) in the ‘Supports’ aspect, 5 out of 19 comparisons showed significant differences at significant  $p < .05$  level; in which one comparisons reached significant  $p < .01$  level. 2) As to the ‘Countries’ aspect, there were four out of 19 comparisons reached significant differences at  $p < .05$  level only. This finding imply that even if there were 9 out of 38 comparisons reached significant  $p < .05$  level (see Table 4), it did not means those nine MFs play much important roles in the participants’ engagement motivations and other MFs can be ignored. To better develop or improve the participants’ motivations, educators still need to implement the “three needs” – ‘Competence Needs’, ‘Relatedness Needs’ ‘Autonomy Need’ as a whole process interpreted by Ryan and Deci (Ryan, Deci, 2000).

For the reasons why those volleyball players who financially supported by parents scored significant higher than those of supported by school, based on the inside information from those participants’ teams or schools the explanation could be: these players had potentials to become excellent players, he / she had already played important roles in their team; his / her family had rich income, and they know that in near future they will play for higher level’s competitions (e.g., the competition of university varsity or professional level). Plus whenever their teams need financing support from the school, because he / she is one of the important player, his / her expense will be covered. This may the reason why less players selected they were supported by school/team.

As to why the youth volleyball players from PRC scored higher than those from the USA, the inside information from those participants’ teams or schools was: This finding was somewhat surprise, because many peoples expected: players from USA would score higher than from the PRC. In fact that was not true. When comparing the motivation factors differences between the PRC and The USA, people need to keep these in mind: China has much more population, no enough universities / colleges allow young people to be enrolled. Situation in the USA was quite differ: The US is a country own most universities / colleges on the earth, the majority young people in US can go to universities / college if they want to. Other than that, young people in US have other options such as: get a job, create a business, and join the army after their high school graduation. In contrast, youth players in China have much less opportunities go to college, get a job, or create a business; this may cause the Chinese youth volleyball players motivated themselves to work harder and play better volleyball so that volleyball can become their unique skill for accomplish their goal (e.g., get extra scores in college enrollment).

As we stated at the beginning, “research studies involved motivations of taking part in youth volleyball athletes are extremely limited”, this is why we defined the current study as “An exploring ...” Fortunately, after searching the whole database on volleyball players’ motivation topic, one study was found. That is: *The Cognitive and Motivation Intervention Program in Youth Female Volleyball Players*. In this study, the researchers examined 34 female youth volleyball players’ motivations (Claver et al, 2017) using the Self-Determination Theory (Deci, Ryan, 1985; Deci, Ryan, 2002). Their key method or technique was a repeat measures MANOVA [2 (groups: experimental vs. control) x 2 (times: pre-test vs. post-test)]. Groups x times interaction effect was analyzed. Their findings revealed that: significant differences in the post-test measurement between the experimental group and the control group, wherein experimental group obtained higher scores than control group with regard to the following variables: a) basic psychological need satisfaction of autonomy and competence; b) autonomous motivation; c) procedural knowledge; and d) perceived performance and sport-engagement commitment (Claver et al., 2017). Their study provided the relevance of the cognitive-motivational processes, not only for improving youth players’ skill performances but also for understanding participants’ sport engagement commitment; and their intervention programs have important implications for the youth sport coaching as well (Claver et al., 2017).

After all discusses above, what else should we do? Besides certain differences existing between the current study and those previous studies, there are some similarities as well. For example, using the previous studies’ findings for the sport of tennis, soccer, and basketball such as: An review of literature in “Motivation in Tennis” by Miguel and Machar (Miguel, Machar, 2007); and the “Research studies in youth athletes’ participation motivations in soccer, and basketball” by Zeng et al (Zeng, Meng, 2017; Zeng et al., 2016).

First, Miguel and Machar (Miguel, Machar, 2007) summarized that: 1) ‘Enjoyment’, ‘Having fun’, and ‘Passion on the sport’ were rated as top three important motivation factors for the success

of youth tennis players. Second, 'Improving performance', 'Keeping fit' and 'Socializing' were rated as their basic reasons for keeping them involved in the sport. Third, 'Feeling important and popular', and 'Earning rewards' were ranked as lower influence motivations. And last, School / club / team atmosphere and having a good relationship with the coach were also ranked as less or lower important factors on players' motivation (Lippitt, 2012). Simply by checking with the findings of the current study, it is easy to find out that, there are so many similarities.

Second, research findings from youth soccer and basketball by Zeng et al (Zeng, Meng, 2017; Zeng et al., 2016) indicated that: the top six factors were 'Technical content & unique value', 'To meet friends', 'For fun', 'To make new friends', 'For my biography', and 'To establish prestige'; the other six factors, however, possessed less or lower impact power on these youth soccer player's motivation, including: 'Get the recognition', 'To improve health', 'For one unique skills', 'To reduce troubles', 'To be a professional', 'To satisfy family's will'. Furthermore, Zeng, and Meng (Zeng, Meng, 2017) in their "Youth basketball players' motivations" described that: the top six factors were 'Technical content and unique value', 'To develop a extraordinary skills', 'For getting healthier', 'For enjoyment and happiness', 'To improve my own-biography', and 'To improve physical fitness'; these six factors possessed the highest impact power on these youth volleyball players' motivation. These findings were similar to the findings of our findings as well (Zeng, Meng, 2017).

Additionally, due to no study has covered the 'Health-related behaviors' in the youth volleyball topic that we cannot make any comparison about it. This study, then, did an exploring survey in this concern. To the results presented in Table 5, we are not going to make comments on how good or not so good about their 'Health-Related Behaviors', but the findings in Table 5 did reflect the current status of 'Health Related Behaviors' of the participants. Generally speaking, this belongs to a set of qualitative data. Each item in this part provided four options; participant can circle the option that is most match his/her situation. Frequency and percentage in each item was used for reflecting the results.

As a whole, the results implied: 1) during their practices and competitions these youth players obtained correct education in 'Eating habits', 'Nutrition knowledge', 'Risk behaviors', and 'Hygiene behaviors' from their coaches / instructors. 2) There is room for improvement regarding these YVPs' 'Health-Related Behaviors' although their score were reasonably good. 3) The results have also indirectly reflected these youth volleyball teams / schools have strict regulations to manage their athletes' daily life. From health education perspective, we believe that is a positive and beautiful thing deserves to recommend to the other youth sports. From this consideration, our findings are consistent with the point view from a literature review by Geidne, et al. (Geidne et al., 2013); they stated that: build up healthy public policy in youth sports is important, organizations (Teams/schools) of youth sports should recognize and match up with the changes in health regulations at a central level, and then implement these regulations to different types youth sports teams/schools. Regarding all the changes in regulations or policies, there is one thing in common: that is, youth athletes' health must be put in the management agenda (Geidne et al., 2013).

## 5. Conclusion

In conclusion, (a) the following reasons/factors are crucial and play important effects on the YVPs' engagement motivations <sup>-Note:</sup> MF1 'Technical content & unique value', MF3 'Healthier body', MF11 'Foster self-esteem', MF4 'For enjoyments', MF10 'To become a professional-player', MF2 'For having fun', MF9 'To improve physical health', MF5 'To meet friends', MF7 'To contest winners', MF6 'To make new friends', MF13 'To establish prestige', and MF14 'To get recognitions'. Although the other seven MFs in AYSAMHRBQ (Zeng, Meng, 2017) are essential, it is not as powerful and the above 12 FMs. <sup>-Note:</sup> (The above list was based on its impact power, from high to low). (b) The findings of this investigation revealed: 'Gender' and 'Goal-setting' are not the determination aspects; but the 'Supporting' and Countries' aspect are. Which means: to maintain and improve the YVPs' engagement motivations level, coaches and instructors who working in the youth volleyball programs need to make sure there are enough supports from parents and schools; increasing meaningful interaction activities between the PRC and USA, learn from one another as well. (c) The findings discovered that: the 'Intrinsic factors' possess noteworthy higher impact power than the 'Extrinsic factors'. Such as: MF1 'Technical content & unique value' and MF4 'For enjoyments' possess the highest impact power on these youth volleyball player's motivations. (d)

Some MFs possess less impact power, such as: MF12 ‘To improve reputation’, MF15 ‘To reduce pressure’, and MF19 ‘To satisfy family’s will’; it did not mean these MFs can be ignored. Youth volleyball educators need to base on profounder diagnosis and analysis on their players’ situations and utilize these research findings correspondingly. (e) With regarding to the health related behaviors, although there is room for improving, it should be able to conclude that the grand mean score of the participants’ health related behaviors should be located in between the position of ‘Very good -4’ and ‘Good’ -3’ if using a four points assessment scale.

### 5.1. Recommendations

The current study explored the youth volleyball players' engagement motivations and health related behaviors. From other perspective, team atmosphere and good relationship between coaches and players also influenced youth players' engagement motivations. Although the values of youth players' engagement motivations have been recognized by some youth sports researchers (Miguel, Machar, 2007; Smith et al., 2006; Lippitt, 2012; Zeng, Meng, 2017). Further studies, however, are certainly needed, especially in the area of how the intrinsic motivation and extrinsic motivation work differently on different types of youth volleyball players, such as: 1) players who set up their goal ‘to become professional’ or ‘to be a non-professional’; 2) players who are financing support by-school or by parents (Lippitt, 2012); and 3) different gender of the players. Additionally, those health-related behaviors been explored in the current study could be another research topic, it deserves researchers who have interests in youth sports to pay attention, because only those youth players who have developed their positive health-related behaviors during their youth years have chance to become future volleyball stars and make their sport-star dream come true.

### 5.2. Application in youth sport

The findings of this study added a set of new data and information regarding the essential reasons / factors that truly motivated the youth volleyball players engaging in practices and competitions, and unique features about these players' health related behaviors as well. These findings can be lively examples and meaningful evidences to apply to youth sports educational programs. If this can be done that will lead better teaching, coaching and managing in youth sports.

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### 7. Conflict of interest statement

The author declares that there is no conflict of interest regarding the publication of this paper.

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