



A Descriptive Gender Specific Study on the Variations and Association between Emotional Intelligence and Emotional Eating among Elite Varsity Swimmers

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ABSTRACT

Psychological well-being of varsity elite athletes has garnered significant attention of researchers in the recent years. The immense academic and athletic pressures may further give rise to several psychological disturbances including Emotional Eating (EE) and disrupted Emotional Intelligence (EI). Therefore, to examine the gender specific variations and association between EE and EI among elite varsity swimmers was the leading focus of this study. The final sample was limited to 143 elite varsity swimmers (age $M = 21.34$, $SD = 1.800$) of which 78 were male and 65 were female in gender. The study employed a demographics questionnaire, BEIS-10 and EEQ-10 to obtain data. The study employed descriptive statistics, MLR analysis and Mann-Whitney U test to analyze data. The findings reported exceptionally high EE behaviors in female elite varsity swimmers as compared to male varsity counterparts. Whereas, male elite varsity swimmers scored higher on all five EI factors in comparison with female elite varsity swimmers. Additionally, the MLR analysis presented that EI factors significantly moderately predicted EE among male elite varsity swimmers. Among these EI factors, only "Appraisal of others' emotions" and "Regulation of own emotions" demonstrated a substantially negative link with EE. In contrast, for female elite varsity swimmers, only financial status remained a strong predictor of EE. Although the collective EI model did exhibit some predictive power however none of the individual EI factors demonstrated any meaningful relationship with EE among them. These findings highlight the necessity to produce targeted strategies to improve EI skills of varsity elite swimmers.

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1. Introduction

Psychological well-being of elite athletes, particularly those enrolled in higher education institutions has garnered significant attention of researchers in the recent years. This might be because elite varsity athletes are usually exposed to immense pressures arising from hectic training routines and academic workload (Grasdalsmoen, Clarsen, & Sivertsen, 2022). This immense pressure may further give rise to several psychological disturbances including disordered eating behaviors or Emotional Eating (EE) (Carpio-Arias et al., 2022). EE can be referred to as a psychological phenomenon in which an individual engages in unnecessary intake of food as a reaction to negative emotional states (Dakanalis et al., 2023). It isn't like the common physiological hunger where body signals the brain to initiate the intake of food for fulfilling the energy requirements (Carpio-Arias et al., 2022). Rather, it is a coping mechanism

which utilizes the consumption of food as a tool to regulate discomfort of emotions (Ljubicic et al., 2023). It is most likely to arise from some common negative psychological states including anxiety, stress and poor body image (Guerrini-Usubini et al., 2023). Evidence gathered from prior studies has revealed an alarmingly high prevalence of EE among varsity athletes. It has been reported that around 30 to 40% of the varsity athletes, enrolled in colleges or universities, might exhibit some patterns of emotional eating behaviors (Grajek et al., 2022; Sze et al., 2021; ul Haq et al., 2024). While utilizing food as a coping mechanism for stress, varsity athletes may intentionally or unintentionally consume high caloric food that is poor in nutrients (de Souza et al., 2021). This consumption of poor nutrient diet may further cause irregular and unhealthy fluctuations in weight (AlMughamis, AlAsfour, & Mehmood, 2020). They may also feel low on energy and might take more than usual to recover after workouts due to this EE behavior (Torres-McGehee et al., 2023). Particularly, in a competitive sports environment, where discipline eating is often linked to improved performance and better body image, EE may compromise their physical conditioning along with psychological well-being (Barker et al., 2025). However, to counter these negative psychological influences, Emotional Intelligence (EI) can be proposed as a remedy to regulate emotions rather than irregular intake of food among varsity athletes.

On the other hand, Emotional Intelligence (EI) can be referred to as the potential of an individual to manage, regulate and understand not only one's personal emotional experiences but also the emotions of others (Bru-Luna et al., 2021). It has been observed that prominent EI levels might improve the stress management ability among individuals (Rodriguez-Romo et al., 2021). In particular for varsity athletes, who are living in a physically and mentally demanding environment, EI might serve as crucial psychological asset (Rubio et al., 2022). Due to better management of stress and regulation of emotions through EI, varsity athletes might be able to cope with disordered eating behaviors like EE (Shahan, Ali, & Rasool, 2023). On the other hand, existing studies on the relationship between EE and EI have presented mixed outcomes. For instance, a study conducted on elite judo athletes revealed that high EI was substantially negatively linked to EE attitudes among them (Filaire, Larue, & Rouveix, 2011). Whereas, another study conducted by Costarelli and Stamou (2009) on elite combat sports athletes of Greece revealed no notable association between EE and EI within this population. However, most of these studies have only focused on general athlete populations leaving behind a notable research gap in understanding how this association unfolds in other specialized groups such as elite varsity swimmers.

Additionally, due to unique physical and psychological demands, elite varsity swimmers might be considered amongst the most ideal populations for this study (Li et al., 2024). This is because psychologically, elite varsity swimmers may face a multitude of negative emotions arising from competitive athletic expectations (Siekanska & Blecharz, 2020). To maintain their position in the team and to continue with the scholarship, they may experience heightened stress levels and performance anxiety (Howarth et al., 2023). Furthermore, with respect to physical demands, swimmers are bound to follow and maintain certain body composition levels. In order to meet those standards, elite varsity swimmers might face elevated body image concerns leading to disordered eating patterns including EE (Mihailescu et al., 2021). Conversely, gender may also exert a notable role in this context as female varsity elite swimmers may be more fragile to several unique psychological challenges as compared to male elite varsity swimmers (Parlov et al., 2020). These unique stressors may include fluctuations in their hormones, maintenance of beauty standards and heightened negative body image concerns (Berengüí et al., 2024). All of which may collectively contribute to the rise of maladaptive eating behaviors including EE.

1.1. Objectives of the study

Even though these concepts are crucial constructs in an elite varsity athlete student's life, however, thus far there is no evidence of any existing study carried out in this regard to explore the variations and association between EE and EI with a gender specific approach. Therefore, to examine the gender specific variations and association between EE and EI among elite varsity swimmers are the leading focus of this study. For this purpose, the study is divided into four major objectives: 1) To investigate the gender specific variations in EE behaviors among elite varsity swimmers; 2) To test for the gender specific variations in EI levels among elite varsity swimmers; 3) To examine the link between EE and EI among male elite varsity

swimmers; 4) To evaluate the relationships between EE and EI among female elite varsity swimmers. By understanding these variations and association in both genders, this study might be able to present a detailed understanding of how being emotionally intelligent may influence the eating behavior patterns among both genders. Furthermore, the findings may also facilitate the relevant sports psychologists, coaches and practitioners in developing gender specific interventions to meet the needs of both male and female elite varsity swimmers for improved physical, psychological and overall well-being.

1.2. Hypothesis

We predicted that gender specific variations might exist in EE behaviors among varsity elite swimmers. Our predictions were derived from the findings of the studies conducted on elite athletes and general populations of both gender (Darling et al., 2017; Suel, 2020). Moreover, we also hypothesized that gender specific differences may occur in EI scores among varsity elite swimmers. These assumptions were drawn from the outcomes of studies administered on varsity athletes of both genders (Aouani et al., 2022; Dumciene & Sipaviciene, 2021). Subsequently, it was further anticipated that there may be a substantial link between EE and EI among male elite varsity swimmers. These proposed outcomes were based on the findings of past studies conducted on general populations in a similar context (Vasileiou & Abbott, 2023; Zysberg, 2018). Lastly, we went on to assume that notable association between EE and EI may potentially emerge among female elite varsity swimmers. These anticipated results were built upon the findings of a few past studies conducted on a variety of female general populations (Costarelli, Demerzi, & Stamou, 2009; Zysberg, 2018)

2. Method

2.1. Study Design

Initially, the design for this study was set to be descriptive in nature. However, it was later specified as a quantitative cross-sectional study.

2.2. Participants' Recruitment Criteria

Only those who fulfilled the following criteria were considered as study population:

- Individuals must have either national or international status in swimming.
- They must be a current Bachelors or Masters student in any private or public sector university.
- They must be ranging within an age bracket of 18 to 25 years.
- Varsity elite swimmers of both genders were admissible for the study.
- Lastly, they must have participated in intervarsity sports competitions as a member of their university's swimming team.

2.3. Population

In a highly conservative and religiously shaped country like Pakistan, participation of females in sports is often limited by several barriers (Laar, Shi, & Ashraf, 2019). Particularly, those sports activities which accompany revealing costumes such as swimming are strongly influenced in this context (Ge et al., 2022). Even if some females succeed in participating in these types of sports, it becomes nearly impossible for them to reach at its elite levels. Moreover, the participation of both male and female swimmers at elite levels is further constrained due to the lack of indoor infrastructures and top-class facilities in the country (Snape & Binks, 2008). Therefore, it was a significant hurdle for even us to track down varsity elite swimmers specially females. Secondly, the strict eligibility criteria (outlined above) further tightened the process of participants' inclusion. However, we were still able to track down 160 participants with 89 male and 71 female elite varsity swimmers. Due to limited existing population in this particular context, we initially considered the whole population as the participants for the study. Among these, 11 male and 6 female participants were further omitted or removed due to clashes in their schedule, disinterest or their unavailability during the study period. Hence, the final sample was then limited to only 143 elite varsity swimmers, constituting to a response rate of 89.37 %. Among these 143 participants, 78 were male and 65 were female in gender

2.4. Sample Size justification

To justify the sample size for this study, we ran a priori power analysis using G*Power v 3.1 software. The priori power analysis was conducted based on linear multiple regression

analysis that involved five predictor variables. The effect size was set at 0.15 (i.e. medium) along with alpha level being 0.05 and power being 0.80. The output obtained demonstrated that to achieve an adequate level of statistical power, it was compulsory for us to include a minimum of 92 participants in our study (i.e. 46 participants for each group). Since, the final sample for this study consisted of 143 varsity elite swimmers (78 males and 65 females) which exceeded the minimum sample size requirement. Therefore, the statistical power of this study can be considered sufficient to detect medium-sized effects with acceptable confidence.

2.5. Data Collection Instruments

Data was collected using an instrument which consisted of the following three portions:

2.5.1. Demographics

The initial portion of the instrument was composed of 7 questions regarding gender, age, marital status, area of residency, financial status, sports participation level and sports experience.

2.5.2. Brief Emotional Intelligence Scale (BEIS-10)

To gather data regarding EI, we opted for a brief 10-item tool developed by Davies et al. (2010). This tool, also known as BEIS-10 is further classified into 5 components. Each of these components measures a unique dimension of emotional intelligence associated with every individual. Our decision to utilize this tool for the current study was based on several factors. Primarily, this tool has particularly been utilized in a similar student athlete population consistently in many past studies (Kim, Lee, & Cho, 2025; Thomas, Allen, & Sung, 2024; ur Rehman et al., 2025). Secondly, it has been identified to exhibit good Cronbach's alpha scores ranging between 0.86 to 0.91 (Thomas, Sung, & Bretl, 2023; ur Rehman et al., 2025). To measure the reliability of BEIS-10 tool for this study's population, we utilized the split-half method. The Spearman-Brown Coefficient value of .871 for both equal and unequal length assumptions suggested high reliability for the scale. Lastly, the Guttman Split-Half Coefficient value of .867 was also high for the tool, which further supported its reliability for the tool (Ahmed, Azhar, & Mohammad, 2024; Mohammad & Ahmed, 2017).

2.5.3. Emotional Eater Questionnaire (EEQ)

The last section of the data gathering instrument featured a 10-item scale to measure emotional eating among participants. This tool is widely recognized as EEQ and was constructed by Garaulet et al. (2012). This questionnaire has previously been employed by multiple studies to measure the EE levels among similar population types (Barcın-Güzeldere & Devrim-Lanpir, 2022; Sosa-Cordobes et al., 2022). Additionally, the Cronbach's alpha scores as reported by Bozkurt, Camli and Kocaadam-Bozkurt (2024); Farhangi (2019) ranged between 0.71 to 0.84 while indicating acceptable to good reliability of the tool. On the other hand, we utilized split-half method to measure the reliability of EEQ for this study. Both Spearman-Brown and Guttman Split-Half Coefficient value of 0.75 indicated acceptable levels of reliability for EEQ.

2.6. Ethical considerations

To comply with the ethical standards of research, we first obtained the ethical approval to conduct this study from the Office of Research, Innovation and Commercialization (ORIC) of our institution (GCU-IIB-675). Secondly, before employing the data collection tools, official permissions from original authors were obtained through email.

2.7. Data Collection Procedure

Prior to the commencement of the procedure, all participants were briefed regarding their voluntary participation in the study. They were also assured that their responses would be kept private and the data gathered would only be used for research purposes. They were guaranteed that taking part in the study wouldn't affect them in any way. The questionnaires were then distributed one by one to each participant. They were encouraged to ask any questions in case of difficulty regarding understanding of any question. On average, each respondent spent approximately 20 to 25 minutes to complete all sections of the questionnaire.

3. Data Analysis

All statistical procedures were executed by utilizing IBM SPSS software v 27.0. To determine the descriptives such as frequency, mean and standard deviation (SD) of the gathered data, descriptive statistics were applied. Whereas, to determine the differences in mean scores of EE and EI among both groups, Mann-Whitney U test was administered. This non-parametric statistical test is considered appropriate when sample sizes of two groups are unequal. In case of this study, male elite varsity swimmers' group comprised of 78 participants whereas, female elite varsity swimmers were 65 in number. Conversely, to examine the association between EE and EI among male and female varsity elite swimmers, multiple linear regression (MLR) analysis was conducted. The significance level to determine significant results was set at 0.05. Finally, we also made sure that all necessary assumptions of MLR including checking for linearity, multicollinearity and homoscedasticity were successfully met.

4. Results

4.1. Descriptive Statistics

The included sample consisted of 143 participants that were having a mean age of 21.34 and SD of 1.800. Of these included 143 participants, 78 (54.5%) were male and 65 (45.5%) were female in gender. Only 11.9 % (17) of these participants were married whereas the remaining 88.1 % (126) were single. Around 68.5 % (98) participants were a resident of urban area while 31.5 % (45) belonged to rural areas. (See Table 1)

Table 1: Demographics Characteristics of the Participants

Variables	f (% age)	M	SD
Age		21.34	1.800
Gender			
Male	78 (54.5)		
Female	65 (45.5)		
Marital status			
Single	126 (88.1)		
Married	17 (11.9)		
Area of residency			
Urban	98 (68.5)		
Rural	45 (31.5)		
Financial Status			
Earn enough to live	32 (22.4)		
Middle-class	75 (52.4)		
Wealthy	36 (25.2)		
Sports Participation Level			
National	109 (76.2)		
International	34 (23.8)		
Sports Experience		5.48	1.823

"Note: N = 143, f = Frequency, % = percentage"

The financial condition of the participants (as mentioned in Table 1) was also quite instable as 22.4% (32) were earning enough to live while 52.4% (75) reported being middle-class. On the other hand, around 25.2 % (36) participants reported being wealthy financially. Lastly, with respect to their participation level in sports, 76.2% (109) were competing at national level whereas, 23.8% (34) were international athletes. Collectively, the mean experience value for all participants was reported to be 5.48 with a SD of 1.823.

4.2. Primary Analysis

4.2.1. Gender specific differences in EE among elite varsity swimmers

To examine the gender specific differences between EE among elite varsity swimmers, we applied the Mann-Whitney U test. (See Table 2)

Table 2: Results of gender differences in EE using Mann-Whitney U test

Variable	Mean Rank		Median		U	Z	p
	Male	Female	Male	Female			
EE	52.08	95.90	17.00	22.00	981.50	-6.320	<.001

"Note: n = 143"

The results obtained unveiled a statistically significant difference in EE scores among both male and female varsity elite swimmers with $U = 981.50$, $Z = -6.320$ and $p = <.001$. The mean rank values for female elite varsity swimmers (mean rank = 95.90) were substantially higher than male elite varsity swimmers (mean rank = 52.08) with a large negative effect size of $r = -0.52$. Additionally, the median values of female elite varsity swimmers ($Mdn = 22.00$) were also larger than male elite varsity swimmers ($Mdn = 17.00$). These findings collectively suggested that female elite varsity swimmers possessed notably higher EE tendencies compared to their male varsity elite counterparts.

4.2.2. Gender specific differences in EI among elite varsity swimmers

We applied Mann-Whitney U test compare and evaluate gender-specific patterns in EI scores among elite varsity swimmers.

Table 3: Results of gender differences in EI using Mann-Whitney U test

Variables	Mean Rank		Median		U	Z	p
	Male	Female	Male	Female			
Appraisal of own emotions	102.97	34.83	10.00	6.00	119.00	-10.322	<.001
Appraisal of others' emotions	85.85	55.38	8.00	8.00	1454.50	-4.616	<.001
Regulation of own emotions	94.06	45.52	9.00	7.00	814.00	-7.166	<.001
Regulation of others' emotions	85.69	55.57	9.00	8.00	1467.00	-4.449	<.001
Utilization of emotions	97.81	41.02	10.00	7.00	521.50	-8.489	<.001

"Note: $n = 143$ "

The results revealed that the EI component "Appraisal of own emotions" was remarkably higher in male elite varsity swimmers ($Mdn = 10.00$) as compared to female elite varsity swimmers ($Mdn = 6.00$) with $U = 119.00$, $Z = -10.322$ and $p = <.001$. The effect size of $r = -0.86$ indicated that a large and significant difference existed between both groups. Similarly, the findings of Mann-Whitney U test also demonstrated a statistically significant difference in EI factor "Appraisal of others' emotions" scores among both groups with $U = 1454.50$, $Z = -4.616$ and $p = <.001$. Although the median scores for both groups were identical, however the differences were reflected in mean rank scores where male group (mean rank = 85.85) showed generally higher scores than female group (mean rank = 55.38). This suggested that male elite varsity swimmers possessed higher "Appraisal of others' emotions" factor than female counterparts. Furthermore, the effect size of $r = -0.38$ indicated a moderate but notable difference between both groups. In addition, the outcomes further highlighted that the EI dimension "Regulation of own emotions" was also substantially higher in male elite varsity swimmers ($Mdn = 9.00$) as compared to female elite varsity swimmers ($Mdn = 7.00$) with $U = 814.00$, $Z = -7.166$ and $p = <.001$. These variations between both groups were highly significant due to a larger negative effect size of $r = -0.59$. Moreover, the results regarding the EI factor "Regulation of others' emotions" also presented parallel findings. The outcomes illustrated that the EI dimension "Regulation of others' emotions" was considerably higher in male elite varsity swimmers ($Mdn = 9.00$) as compared to female elite varsity swimmers ($Mdn = 8.00$) with $U = 1467.00$, $Z = -4.449$ and $p = <.001$. Due to a medium negative effect size of $r = -0.37$, there was a moderate variation with respect to this particular EI factor among both groups. Lastly, the results also exhibited that the factor "Utilization of emotions" was significantly higher in male elite varsity swimmers ($Mdn = 10.00$) as compared to female elite varsity swimmers ($Mdn = 7.00$) with $U = 521.50$, $Z = -8.489$ and $p = <.001$. The large negative effect size of $r = -0.71$ indicated exceptionally significant variations between groups of both genders.

4.2.3. Association between EE and EI among male elite varsity swimmers

During the preliminary analysis, none of the confounding variables demonstrated any significant correlation with the dependent variable EE among male elite varsity swimmers. Due to which, we considered applying Multiple linear regression (MLR) to explore the relationship

between EE and EI among male elite varsity swimmers. The findings emerged from the ANOVA table yielded significant results. (See table 4)

Table 4: ANOVA Table

Dependent Variable		Sum of Squares	df	Mean Square	F	Sig.
Emotional Eating	Regression	139.399	5	27.880	6.919	.000 ^c
	Residual	290.140	72	4.030		
	Total	429.538	77			

^cNote: c = Predictors i.e. EI factors

The results revealed that EI factors collectively predicted 32.5 % variance in EE scores among male elite varsity swimmers with $F(5, 72) = 6.919, p = <.001$. Whereas, among the EI factors, only Appraisal of others' emotions ($\beta = -0.354, p = 0.001$) and Regulation of own emotions ($\beta = -0.223, p = 0.04$) showed negative significant relationship with EE. This suggested that high levels of "Appraisal of others' emotions" and "Regulation of own emotions" might diminish the EE tendencies among male elite varsity swimmers.

Table 5: Regression Coefficients of EI factors on EE among Male Elite Varsity Swimmers

Dependent Variable	Predictor EI (Factors)	Variable	B	SE	β	t	p
Emotional Eating	Appraisal of own emotions		-0.312	0.288	-0.126	-1.083	0.282
	Appraisal of others' emotions		-0.894	0.268	-0.354	-3.331	0.001*
	Regulation of own emotions		-0.496	0.242	-0.223	-2.046	0.044*
	Regulation of others' emotions		-0.482	0.251	-0.238	-1.921	0.059
	Utilization of emotions		-0.312	0.301	-0.136	-1.034	0.304

^cNote: EI = Emotional Intelligence; * $p < 0.05$

Lastly, no significant link between the EI factors Appraisal of own emotions ($\beta = -0.126, p = 0.282$), Regulation of others' emotions ($\beta = -0.238, p = 0.059$), Utilization of emotions ($\beta = -0.136, p = 0.304$) and EE were observed among male elite varsity swimmers as a result of MLR. (Details are presented in Table 5)

4.2.4. Association between EE and EI among female elite varsity swimmers

In case of female elite varsity swimmers, the output retrieved from the Pearson correlation analysis demonstrated that one of the confounding/demographic variables i.e. financial status was significantly correlated with dependent variable EE. Consequently, to control for its effect, we shifted towards hierarchical MR analysis to determine the connection between EI and EE among female elite varsity swimmers. In addition, the confounding variable (financial status) was added in the first step whereas, the EI factors (independent variables) were inserted in the second step of the hierarchical MR analysis. The ANOVA table did produce meaningful results. (See Table 6)

Table 6: Results of Hierarchical Multiple Regression analysis

Table of Results of Hierarchical Multiple Regression Analysis										
Dependent variable	Predictors	B	β	t	p	95% CI		R ²	ΔR^2	p
						Low	Up			
Emotional Eating	Step 1							0.079	0.079	0.024 ^c
	Financial status	-2.045	-0.280	-2.317	0.024*	-3.808	-0.282	0.216	0.135	0.024 ^d
	Step 2									
	Financial status	-2.741	-0.376	-2.888	0.005*	-4.640	-0.841			
	Appraisal of own emotions	0.849	0.246	1.888	0.064	-0.051	1.750			
	Appraisal of others' emotions	0.440	0.138	0.907	0.368	-0.531	1.411			
	Regulation of own emotions	0.302	0.112	0.806	0.424	-0.448	1.052			
	Regulation of others' emotions	-0.718	-0.266	-1.643	0.106	-1.594	0.157			
	Utilization of emotions	0.319	0.090	0.716	0.477	-0.574	1.212			

^cNote: c = family income; d = family income and EI factors; * $p < 0.05$

The outcomes of the first step of the regression model revealed that the confounding variable financial status was meaningfully negatively associated with EE as $F(1, 63) = 5.371, p = 0.024$. Additionally, the financial status explained around 7.9 % of variance in EE due to the

R^2 value being 0.079. On the other hand, after adding all five EI factors in the second step, the overall model still remained significant with $F(6, 58) = 2.663$, $p = 0.024$ and the variance was increased to 21 %. Even though the confounding factor financial status still remained significant ($\beta = -0.376$, $p = 0.005$) in step 2. However, none of the individual EI factors Appraisal of own emotions ($\beta = 0.246$, $p = 0.064$), Appraisal of others' emotions ($\beta = 0.138$, $p = 0.368$), Regulation of own emotions ($\beta = 0.112$, $p = 0.424$), Regulation of others' emotions ($\beta = -0.266$, $p = 0.106$) and Utilization of emotions ($\beta = 0.090$, $p = 0.477$) demonstrated a significant association with EE. These findings highlighted that although the inclusion of EI factors modestly improved the explanatory or predictive power of the overall model. However, financial status remained the only significant predictor of EE among female elite varsity swimmers. This further suggested that female elite varsity swimmers with low financial status may be more prone to EE, irrespective of their EI levels.

5. Discussion

In light of the available literature, until now, no study has particularly focused on assessing the gender specific association between EE and EI among varsity elite athlete population, particularly elite varsity swimmers. Therefore, to bridge this scientific void, this study was specifically designed while utilizing the cross-sectional approach. The results of the study demonstrated noteworthy and novel outcomes. The findings from the Mann-Whitney U test reported exceptionally high EE behaviors in female elite varsity swimmers as compared to male varsity counterparts. Whereas, male elite varsity swimmers scored higher on all five EI factors in comparison with female elite varsity swimmers. Additionally, the MLR analysis presented that EI factors significantly moderately predicted EE among male elite varsity swimmers. Among these EI factors, only "Appraisal of others' emotions" and "Regulation of own emotions" demonstrated a substantially negative link with EE. In contrast, for female elite varsity swimmers, only financial status remained a strong predictor of EE. Although the collective EI model did exhibit some predictive power however none of the individual EI factors demonstrated any meaningful relationship with EE among them. These results stress upon the need to produce targeted strategies to improve EI skills and financial status of varsity elite swimmers. These interventions might facilitate in countering disordered eating patterns particularly EE among varsity elite swimmers of both genders.

The findings related to the differences in EE scores among male and female varsity elite swimmers were consistent with the predictions. The outcomes suggested that female elite varsity swimmers scored higher on EE scale as compared to male varsity counterparts. This implied that female elite varsity swimmers may possess higher EE tendencies than male varsity elite athletes. As per our understanding of the existing literature, no current study has particularly explored the gender specific differences in EE behaviors among varsity elite athlete population particularly swimmers. However, a few studies have utilized this gender specific approach to examine EE levels among elite athletes and general populations that presented similar outcomes (Darling et al., 2017; Konttinen et al., 2010; Suel, 2020). For instance, a study on elite basketball players conducted by Suel (2020) suggested that female elite basketball players reported higher levels of EE than male players. Additionally, another study on general population also revealed that female participants showed higher tendency of EE behaviors than male participants. Although, to explore the possible underlying mechanisms for this high EE tendencies among female elite varsity swimmers were not the objective of our study. However, based on the existing evidence, it can be proposed that due to consistent exposure to intense academic and training regimens, cortisol levels may rise among female swimmers. Cortisol, being the main stress hormone, might spark the food-driven coping behavior among them, eventually leading them to EE behaviors.

On the other hand, findings regarding the gender specific differences in EI scores were also in line with the assumptions. The results revealed that male elite varsity swimmers scored exceptionally higher on EI scale as compared to female participants. This implied that male elite varsity swimmers may be more emotionally intelligent beings than female elite varsity swimmers. These outcomes are consistent with several studies conducted on similar population types such as varsity athletes (Aouani et al., 2022; Dumciene & Sipaviciene, 2021; ur Rehman et al., 2025). To cite an example, Dumciene and Sipaviciene (2021) conducted a study on varsity student athletes to explore the differences in EI levels with respect to gender among them. The results demonstrated that all indicators of EI were substantially higher among male

varsity athletes than female student athlete participants. In a similar realm, an alternate study conducted on varsity athletes of squash sports to examine the variations in EI scores in terms of gender revealed similar outcomes. The results disclosed that male participants possessed higher levels of EI than female varsity counterparts (ur Rehman et al., 2025). The exact underlying mechanisms of these high levels of EI factors in male elite varsity swimmers may emerge from a targeted study in this regard. However, in light of the present evidence, it can be suggested that to meet the societal and social expectations, male varsity swimmers may have developed skills to regulate their emotions. Additionally, the consistent exposure to intense competitions may also have fostered emotional resilience among them, therefore elevating their overall EI.

Moreover, the study highlighted that overall, EI was meaningfully negatively associated with EE among male elite varsity swimmers. This suggested that high EI levels may lower EE behaviors among male elite varsity swimmers. Even though no past study has specifically been conducted to assess the association between EE and EI among varsity athlete population until now. However, a few studies conducted on general populations in a similar context presented consistent findings (Vasileiou & Abbott, 2023; Zysberg & Rubanov, 2010). For instance, a meta-analysis conducted on general population indicated that those participants who revealed high EI levels were most probably associated with low EE patterns (Vasileiou & Abbott, 2023). Similarly, another study conducted within a similar context by Zysberg and Rubanov (2010) on general population also demonstrated parallel results. The outcomes revealed that heightened EI levels were negatively associated with EE patterns within this particular population. The results further revealed that among the EI factors only "appraisal of other's emotions" and "regulation of own emotions" were substantially negatively associated with EE in male elite varsity swimmers. Although, this study was solely focused on examining the relationship between EE and EI and not their underlying dynamics. However, it can still be proposed that high EI levels may initiate adaptive strategies to stress and anxiety among male varsity elite swimmers. This in turn might reduce their reliance on EE attitudes to reduce stress and anxiety therefore promoting healthy and nutritional diet consumption. Nonetheless, further studies are mandatory to affirm these findings and present more concise core mechanisms behind these associations.

Lastly, findings emerged from the two-step hierarchical regression analysis revealed that financial status emerged as a significant predictor of EE among female elite varsity swimmers. Whereas, for EI, the collective EI model did contribute significantly however, none of the individual EI factors showed a statistically significant relationship with EE among female elite varsity swimmers. With respect to EI factors, these findings are quite unique as past studies conducted on general female populations presented inverse outcomes (Costarelli, Demerzi, & Stamou, 2009; Filaire, Larue, & Rouveix, 2011; Zysberg, 2018). For example, a study by Costarelli, Demerzi and Stamou (2009) on young women to examine the relationship between EE and EI suggested that EE was negatively associated with EI factor "Appraisal of own emotions" among them. Conversely, another study conducted on general female population almost presented similar outcomes (Zysberg, 2018). The results suggested that high levels of EI factor "Regulation of own emotions" may reduce EE tendencies among general females.

The lack of significant associations in the current study may suggest that the relationship between EE and EI factors does not generalize to high-performing female athletes. This might be due to distinct psychological and contextual factors that may be influencing this group. Firstly, there is a possibility that unlike male swimmers, female swimmers might experience a variety of emotional stressors apart from performance and societal pressures. These stressors may include body image concerns and hormonal fluctuations which may have influenced differently on EE behaviors among female swimmers. Secondly, rather than trusting their own EI, female elite varsity swimmers might rely on other's advised strategies to counter stress. This may have ultimately mitigated the probable EE-EI link among them. Conversely, with respect to financial status it can be suggested that several broader lifestyle stressors including reduced time for self-care and limited access to nutritional sources faced by varsity elite female swimmers of low-income backgrounds might have led to the increase in EE behaviors among them. These stressors may have overshadowed the EI factors within varsity elite female swimmers, hence making financial constraints a more salient predictor EE behaviors.

4.1. Practical Implications

The outcomes of this study suggested numerous valuable practical implications particularly for varsity elite swimmers of both genders. To begin with, the findings indicated that being a female elite varsity swimmer from a low-income background is the risk for increased EE and reduced EI compared with their male counterparts. This further emphasized that female elite varsity swimmers should be more focused gender in swimmers when dealing with EE and EI. Secondly, male elite varsity swimmers with lower levels of EI were also under more risk of experiencing EE. This suggested that to counter eating related disorders, in particular EE, EI factors particularly "Appraisal of others' emotions" and "Regulation of own emotions" must be incorporated into their training routines. By enhancing these specific EI components among male elite varsity swimmers, the coaches, relevant practitioners and sports psychologists might be able to build a protective layer against maladaptive eating behaviors such as EE. Moreover, through these interventions, male elite varsity swimmers may become better equipped to tackle stress-induced challenges that may promote healthier and improved physical and psychological health.

4.2. Limitations and Directions for Subsequent studies

This study population was comprised of only elite varsity swimmers which considerably limits the generalizability of the findings to other sports participating varsity students. Hence future studies should aim at exploring the association between EI and EE among varsity students of distinct sports. Additionally, due to the study being descriptive cross-sectional in design, self-reported measures were utilized to gather data. This approach is considered relatively weak when comparing to other descriptive designs such as longitudinal or experimental designs such as randomized control trials. Hence, future scholars or researchers must accompany stronger methodological approaches such as longitudinal or randomized control trials to address similar research question.

5. Conclusion

The study was designed to examine the gender specific disparities and associations between EE and EI among varsity elite swimmers. The results suggested that female varsity elite swimmers scored higher on EE scales whereas male elite varsity swimmers reported high EI levels. Moreover, a moderate negative association between EI and EE were observed among male elite varsity swimmers, Whereas, no significant relationship between EE and EI was reported among female elite varsity swimmers. These findings highlight the necessity to produce targeted strategies to improve EI skills that may facilitate in countering disordered eating patterns particularly EE among male elite varsity swimmers.

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