

A Project (Honours Project) entitled

The Relationship between Hong Kong Rugby refereeing level and their level of mental toughness and self-efficacy: Mixed Method study

Submitted by

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Declaration

I, Ngan Ka Chun declare that this research/project report represents my own work under the supervision of Dr Wong Ming Yu Claudia, and that it has not been submitted previously for examination to any tertiary institution.

Signed

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Abstract

Purposes: This study investigates the relationship between mental toughness and performance in Hong Kong rugby referees, who face high-pressure demands as critical arbiters ensuring fair play and match continuity. Despite mental toughness's crucial role in officiating, limited research explores its impact on referees' performance and developmental progression across competition levels within Hong Kong's specific sporting context.

Methodology: This mixed-methods study investigates the relationship between refereeing levels (High/Moderate/Low, $n \approx 60$) and psychological traits (mental toughness/self-confidence) among Hong Kong referees. Quantitative data, collected via anonymous online surveys (Referee Self-Efficacy Scale and Sports Mental Toughness Questionnaire), will undergo one-way ANOVA to assess associations between refereeing levels (dependent variable) and psychological traits (independent variables). Despite a calculated required sample size of 69 (G^*Power ; $f=0.445$, $\alpha=0.05$, $power=0.9$), the anticipated 60 participants necessitate supplementary qualitative interviews (6-9 participants) using the 4C's model (Control, Commitment, Challenge, Confidence) to contextualize findings and address statistical limitations, ensuring a comprehensive exploration of referees' psychological resilience.

Results: The mental toughness and self-efficacy levels are higher for higher-level referees in Hong Kong.

Conclusion: Better mental toughness and self-efficacy could help refereeing.

Keywords: Rugby referee, mental toughness, self-efficacy.

Background

Referees and officials are a big aspect of sports events, especially team ball games. As the England Football Association mentioned in 2021, referees are the cornerstone of the game, their importance cannot be overstated in the game (The Football Association, 2021) No referees, no game. They have huge impacts on the game in multiple ways including applying the rules, making decisions, and controlling the game in their ways. Team sports officials are especially important as there are many situations where uncertainties happen a lot that referees need to step up to take control, so there are some characteristics that will help team sports referees.

Some characteristics are common for referees for team ball games like, rule enforcement and ensuring fair play (The National Basketball Association, 2021), making crucial decisions, and managing the game which affects the strategies and tactics (The Fédération Internationale de Football Association, 2021), reduce the risk of injuries with making critical decisions on dangerous plays and maintain the sportsmanship of the game as part of their job (The International Volleyball Federation, 2021), having good communication with coaches and players to build up the authority towards the players to manage the game well, lastly to adapt themselves in different circumstances and interpret rules appropriately when the play comes to a grey area (The International Rugby Board, 2021).

Being a referee isn't an easy job as seen from the above characteristics; to be a successful referee, he/she will need to be an expert in all of the characteristics mentioned above. The requirements of being a referee in a team ball game are certainly high as you reach a higher competitive level, and they might face different mental issues. Firstly, on bigger occasions, they might need to face huge stress and pressure so that they make the correct

decision that has significant consequences for the game under high-pressure situations. With the pressure of deciding just a split-second cost the teams, they might suffer from anxiety and stress (Jamieson & Orr, 2016). At the same time, it is challenging for referees to regulate their emotions to get the best and most objective outcome for the game under immense pressure (Rees & Hardy, 2000). Furthermore, they might doubt their own decisions during the game while rethinking and reflecting on their previous decisions which might affect their self-belief and self-confidence levels, especially under circumstances with someone challenging your calls and different conflicting opinions from multiple stakeholders (Morris, 2000). Lastly, they will face different levels of abuse and criticism on and off the field including verbal, harassment from fans, players, or coaches which might cause negative psychological outcomes that lead to decreasing self-esteem (Parry & Magill, 2016). Therefore, as referees in team games need to take up different roles and have different responsibilities to the game, they might suffer mentally in different ways under a pressurized environment which causes them mental issues.

Among all characteristics, mental toughness and self-confidence are two stand-out factors to referee at a higher level for referees in team sports, both have huge impacts on refereeing in different ways. Mental fitness is critical for referees to cope with the demands and pressure when officiating at a higher level (Toner et al., 2012). When it comes to a critical game-winning decision of a potential try, a referee with enough in both aspects can maintain composure and confidence when giving out the decision, and mentally tough referees show greater decision-making skills in high-pressure situations (Carr et al., 2013). As referees face different criticism, mental toughness can help them handle this criticism and also greater

resilience. They will be able to bounce back from mistakes previously and concentrate on the ongoing game again to get through difficult situations despite making huge mistakes and getting criticized. Good referees will learn from previous mistakes and quickly recover from their mistakes and learn from it to prevent making the same mistakes again. Referees are human and they won't be perfect, they are not AIs that provide black-or-white decisions but interpret the laws with their knowledge to decide fifty-fifty grey area decisions to get the game going, therefore being mentally tough can help them quickly recover and improve. On the other hand, maintaining high self-confidence can achieve better communication with different people in the game as they can confidently deliver and explain their decisions to persuade players or coaches that didn't agree with them which contributes to providing a more controlled environment with better game management by effective communication. At the same time, it can earn authority and respect from the players and coaches by increasing compliance and consistency with their decisions so that the players and coaches are easy to follow (Morris, 2000).

More specifically in rugby, some characteristics of the referee become more stand out. As rugby is a very physical sport the risk of injuries is certainly higher than in other sports, with 20 to 91 injuries per 1,000 player-hours of exposure in professional rugby showing its high risk. They need to have enough resilience, adaptability, and strong mentality to deal with changing situations (Hanton et al., 2008), and stay composed to make to right decisions for crucial decisions using their authority built on their self-confidence especially based on dangerous plays to ensure player safety. Moreover, rudy referees aren't afraid of making mistakes as there are lots of grey areas that the referee really needs to be fearless to step up to make huge calls, if they make mistakes they can recover quickly and move on to the play but

not blame themselves. Their mentality to maintain focus and learn from mistakes is something special for rugby referees (Toner et al., 2012). Malaysian rugby union produced research on how psychological skills affect rugby referee performances in sevens rugby in their local sevens games. The research showed that anxiety management and confidence both have positive relationships with their performances in the sevens tournament (Nazarudin et al., 2014). Therefore, this research aims to find out does the same outcome in Hong Kong is that higher-level referees have better mental toughness compared with community referees. Mentally tough can enhance the game overall with better management as well as giving the best call for the game which can be reflected in their performance review.

In Hong Kong, rugby is quite popular as a team sport as our sevens team has achieved good results in multiple big events including winning back-to-back gold medals in Asian games and dominating the Asia rugby sevens championship in the past couple of years. They are also in the sevens challenger series fighting to get a place in the regular season. However, unlike the popular sevens, fifteens rugby isn't as well known as sevens, but most of the games in our local regular season are fifteens games, men's games are divided into 7 divisions and women's games into 3 divisions with premiership as their top level. Other than adult games, there are youth games separated into three levels in both boys and girls divisions. There are around 60 games per weekend from October each year to around April in the next year with Hong Kong Sevens as the final event of the regular season. The Hong Kong Referees Society consists of around 60 active members every year refereeing at different levels, with 31 active at the premiership level both refereeing and assisting. The referees can be divided into three

levels according to what level they are refereeing in, Men's Premiership referees and assisting referees, Men's Championship referees, and other community referees. Normally referees will stay at the same level throughout the whole season to maintain their consistency and get used to the level for the whole season, at the same time it can help them to build up relationships with the team captains by getting familiar teams week by week. There is also a development group and youth development group to develop talented referees and young talents to give them a stepping stone to a higher level, they review themselves week by week based on their performances and fitness levels. Psychological training is something that they don't cover.

Methodology

Sample

Participants were divided into three groups, High level, moderate level, and low level. Each group contains 20 participants with a total of around 60 participants. According to research based on Malaysian referee mental toughness (Nazarudin et al., 2014), the sample size of 132 in the research was in accordance with Critical $F(4127) = 2.9040$, $\Lambda = 25.33$. Converting the above analysis to Cohen's F , resulting the effective size of 0.445. Using G*Power software, with the effective size $f = 0.445$, $\text{Alpha} = 0.05$, $\text{Power} = 0.9$, will result in a sample size of 69. Two referees in each group were invited to interview for qualitative research purposes.

Mixed method:

Quantitative data:

For the quantitative part, they are required to complete two questionnaires, one based on their self-confidence and the other one based on their mental toughness. The two questionnaires are The Referee Self-Efficacy Scale (REFS) (Myers et al., 2012) and The Sports Mental Toughness Questionnaire (SMTQ) (Sheard et al., 2009), participants were required to fill both questionnaires online via the attached Google forms. The questionnaire is anonymous and only requires participants to provide their refereeing experience and current level of refereeing in Hong Kong.

After collecting the data, a one-way ANOVA was conducted to analyze the data setting refereeing level as the dependent variable and mental toughness and self-confidence as independent variables to check the relationship between their refereeing levels with mental toughness and self-confidence.

Qualitative data:

For the Qualitative part, a face-to-face or online interview was carried out and recorded at times most convenient for the participants. The interview lasted for approximately 40 minutes. The whole interview was recorded using Zoom recording or phone recording and transcribed into a document for further data analysis. The definition in MT was explained based on the 4C's model (Strycharczyk & Clough, 2014). The 4C's were the four components of mental toughness including control, commitment, challenge, and confidence, the definition of these four was introduced to the participants before the interview. The interview consists of open-ended and non-leading questions (Patton, 2002) based on mental toughness to explore MT in Hong Kong Rugby referees which includes:

1. Personal experience(pre-game, during the game, after the game) that requires MT, and how MT helps you persevere these situations (or situations provided by the interviewer)

2. what do you do in certain situations
3. What goes through your mind in these situations

Situations provided:

High Level:

You are Acting Referee in the HK premiership final red vs blue, the last play of the game in a final, blue team dives to score a try in the corner, but the red tackler arrives at the same time to tackle the ball carrier into touch. You as AR have to make a decision, what will you do, and what will go through your mind?

Moderate Level:

- a fight broke out and all the players got out of control
- getting promoted one level above your normal referee level in the semi-final week

Low level:

- players and coaches constantly shouting at your decisions
- 5050 may be lost forward in goal

The interviewer further elaborated on the situations in the 4C's model, these four components will be raised to the participants throughout the interview to further elaborate on the personal experience or situation related to mental toughness. The qualitative resources were analyzed using thematic analysis. Thematic analysis(TA) is a method of identifying, analyzing, and interpreting patterns of meaning within qualitative data which then can capture interesting features, themes, or trends of the data relevant to research questions (Clarke & Braun, 2016). In this case, this method can analyze mental toughness using the 4Cs model as I mentioned above to investigate the relationship between the qualitative data and mental toughness and how it links to the refereeing level at the end.

Mixed method design combines statistical trends (quantitative) with in-depth behavioral insights (qualitative). Further results will be shown in the discussion as integration.

Results

In terms of Mental toughness, there is no significant difference between the 3 groups. However, referees at higher levels did have better self-efficacy than lower-level referees.

According to REFS, the scale uses a summed scoring method with a maximum score of 65 points and a 5-point Likert-type response format for multiple items. Higher scores indicate stronger self-efficacy beliefs, reflecting greater confidence in handling officiating challenges, decision-making under pressure, and maintaining authority (Myers et al., 2012b). According to table 2, results showed that higher-level referees in Hong Kong have better self-efficacy than low-level referees in Hong Kong. Table 1 shows the mean of the high-level referees is 55.8, moderate-level referees 50.4, and low-level referees 45.5. A one-way ANOVA was performed to compare the REFS results among the three levels, the test revealed that there was a statistically significant difference in the REFS test score between the three groups ($F(2,57)=14.090, p<.001$). As $p<0.5$, a post-hoc test is required. Tukey's HSD test for multiple comparisons found that the mean value of overall scores in the REFS test was significantly different between group 1 and group 3 ($p<.001$, 95% C.I.=5.74,15.26). There was also a significant difference between group 1 and group 2 ($p=.024$, 95% C.I.=.59,10.11). There was also a significant difference between group 2 and group 3 ($p=.031$, 95% C.I.=.39,9.91).

Also for SMTQ, according to table 1, higher scores indicate a greater mental toughness (Brace et al., 2020) with total scores ranging from 14 to 56. Results showed that higher-level referees in Hong Kong have better mental toughness than low-level referees in Hong Kong. Table 2 shows the mean of the high-level referees is 44, moderate-level referees 40, and low-level referees 38. A one-way ANOVA was performed to compare the SMTQ test results among the three levels, the test revealed that there was a statistically significant difference in the REFS test score between the three groups ($F(2,57)=5.821, p=0.005$). As $p < 0.05$, a post-hoc test is required. Tukey's HSD test for multiple comparisons found that the mean value of overall scores in the REFS test was significantly different between group 1 and group 3 ($p=0.004, 95\% \text{ C.I.}=[1.79, 11.11]$).

Apart from quantitative results, qualitative results also showed the difference between high and low-level referees in Hong Kong.

The Thematic analysis based on the 4Cs model, confirms that higher-level referees exhibit significantly stronger mental toughness and self-efficacy. The interview data was analyzed by Clough's 4Cs model of mental toughness, which is control, commitment, challenge, and confidence. The 4 components were slightly different for rugby referees. Control relates to emotion regulation for example their ability to manage emotions and maintain focus under pressure and also post-game composure facing different stakeholders. Commitment relates to preparation rituals and accountability like focusing on goals and persistence despite setbacks. The challenge relates to embracing adversity as a growth opportunity like adapting to high-stakes games and solving conflicts effectively on the field. Last but not least, confidence relates to their self-belief in abilities and decisiveness. Through

the interviews, there were some trends of behavior differences among different levels of referees.

In terms of Control, a high level of referees has intrinsic calm in them where they have autonomous emotional regulations where they can block distractions effortlessly. Moderate-level referees used more structured methods and skills to help them maintain composition during tense situations, like having a pre-game checklist or breathing techniques. However low-level referees were more survival-focused and had reactive anxiety followed by self-doubt. For example, a low-level referee said “Worried about mistakes during warm-ups”.

In terms of Commitment, low-level referees seek external feedback from coaches or other players to have reactive improvement which they rely on post-failure adjustments. Moderate level referees reflect post-games and persist in close games. They could maintain their accountability by balancing consistency with a structured view so that they could maintain their refereeing week in and out. Lastly, high-level referees visualize scenarios preemptively and will learn from errors autonomously where they see errors as growth opportunities. A high-level referee said they “never repeat mistakes and I will learn from my previous errors”. Other than that they maintain their proactive excellence where they see preparation as their second nature. High-level referees were more self-driven kind of person whereas moderate and low-level referees relied on a structured solution and external feedback respectively.

In terms of Challenges, facing challenges different levels of referees had different points of view, low-level referees were survival motivated to face these challenges, moderate-level referees would adapt themselves to these challenges while high-level referees wouldn't see the challenges as threats. Low-level referees mentioned that “I saw final as proving

ground”, they view high-pressure games, like a grand final as tests but they will adapt to the crowd noise. They had early resilience built through survival in adversity. Moderate level referees manage big time moments systematically with their experience where they also accept their ambiguity. A moderate-level referee mentioned “ I use a flowchart to handle player confrontation so that I can slow down and calm myself in big times” When they face challenges during the game, they will have their ways that they are familiar with to solve those challenges. With more and more similar scenarios to come, they treat those as skill-building opportunities to practice their method of solving different situations. High-level referees thrive in adversity and inevitable self-beliefs that their instinct and ability could guide them through the challenges. Even under 50-50 decision circumstances, they believe in their instincts. They leverage challenges to assert mastery. A High-level referee mentioned that” controversial calls were my chance to show my ability, it might be risky but I will make a strong call believing in my guts”.

Lastly, for confidence, low-level referees don’t have enough self-belief so they have to validate their decisions with assistants, external validation will improve their confidence. At the same time, they had to rebuild confidence post-failure. A low-level referee mentioned that “ I will ask my ARs after every try if they agree with the call”. Moderate-level referees project confidence to players as they think confidence is a tool to deter challenges from players. But sometimes if they face challenges after the game, they will be selectively transparent. High-level referees will use their authority to deter dissent as they have unshakable self-belief. Their confidence is intrinsic and rooted based on their validated experience. A high-level referee said,” Players don’t argue, they know I’m right”.

From the above, the results from qualitative research showed that higher-level referees have significantly stronger mental toughness and self-efficacy.

TABLE 1. Means score and Standard Deviation of SMTQ questionnaire.

Components	# Groups	Mean	Std. Deviation
Overall	1	43.95	7.98
	2	39.5	4.37
	3	37.5	5.44
Confidence	1	19.1	3.77
	2	16.9	2.51
	3	16.2	2.73
Control	1	11.45	3.05
	2	8.75	1.55
	3	9	2.13
Constancy	1	13.4	2.44
	2	13.85	1.23
	3	12.3	2.03

TABLE 2. Means score and Standard Deviation of REFS questionnaire.

Components	# Groups	Mean	Std. Deviation
Overall	1	55.805	7.57
	2	50.45	5.53
	3	45.3	5.43
Game Knowledge	1	13.1	2
	2	12.25	2.268
	3	11.1	1.68
Decision Making	1	13.3	1.95
	2	12.1	1.59
	3	9.65	1.76
Pressure	1	12.65	3
	2	10.55	2.65
	3	9.3	2.94
Communication	1	16.75	2.45
	2	15.55	2.12
	3	15.25	1.52

Discussion

With the above results, there were some small components and behaviors found in the mixed research to separate higher-level referees apart from others.

Firstly, based on the SMTQ questionnaire, higher referees maintain better mental toughness in most of the components.

For the REFs questionnaire, the component that stands out from the rest of the other components was the decision-making component. The questions in this component include “I made quick decisions” and “Be firm with your decisions” which relate to how confident they were when it comes to decision-making, Higher-level referees scored significantly higher than lower-level referees with scores of 13.3 and 9.7 respectively. Higher levels referees were more confirmed with their decisions with higher confidence and self-belief where they could make strong on-field decisions in a split second without hesitation which separates them from other referees. I think the reason behind their strong decision-making could be explained through two components in the SMTQ questionnaire. According to the results from the SMTQ questionnaire, control and confidence were significantly different among the three groups, and the two components could highly affect referees in their decision-making process. It includes questions such as “I worry about performing poorly” and “I am overcome by self-doubt” which reflects the emotional control of referees. In the scores of the control component, the higher-level referees had a significantly higher mean score of 11.5 compared with lower-level referees which had a mean score of 9 only. Higher-level referees mostly had more experience compared with fairly new referees which gave them experience-driven cognitive appraisal. Higher-level referees are more likely to perceive stressors as challenges rather than threats, therefore when they face pressurized situations, they could reduce negative emotions including anger and anxiety, and enhance coping mechanisms in the game enabling them to maintain composure during games(Karaçam et al., 2023). Basketball elite referees also maintain better emotional regulations than normal basketball referees. With better control

as rugby referees, they were more likely to face threats and challenges which maintain their focus and lower their anxiety levels. During a rugby game, with all the hostile crowds and contentious decisions, it is so important for them to be anxious and get shaky facing all the threats. If the referee loses their composure and gets shaky with bad emotional regulation, the players will take a chance to get into the referee's head where they will lose their credibility for the rest of the game. At the same time, experience gave higher-level referees coping mechanisms through repeated exposure to high-pressure scenarios. Referees with more experience would use positive self-talk and other cognitive reappraisal strategies to reinterpret anxiety as performance enhancement and reduce stress at the same time (Gross, 2015). Self-talk can help match officials exhibit emotional control which leads to better decision-making as well (Fletcher & Scott, 2009). Also, from the thematic analysis results in the quantitative research, it was found that higher and moderate-level referees have their ways of maintaining control, high-level referees maintain focus based on their self-belief and intrinsic thoughts, while moderate referees have structured methods to help their emotions regulation so that they won't be eaten up by stress and anxiety under high-stake pressurized situations. From the qualitative research part, other than only reflecting higher referees maintain better emotional control when refereeing, it reflects the improving process of lower-level referees to higher-level referees in terms of emotional control. According to a low-level referee, he struggles with self-doubt and he channels anxiety into basic preparation. They think of on-field decisions that might happen during their game and start worrying even before the game starts. But with the experience, moderate-level referees could sort emotions out slightly better in their structured way, they had their emotional coping strategies, however, if something even worse came to them in terms of emotions, their structured coping strategies might fail. High-

level referees had intrinsic abilities to control their emotions under every circumstance which helped them block distractions and control game environments autonomously including different stakeholders and -game rituals. There was a learning path of how to experience steps to build emotional control from low-level to high-level referees, from anxiety-driven regulation and trying so hard to sort self-doubt to gaining experience which enabled them to handle some scenarios to built-in mastery of emotional control and starting to become a natural thing. Higher-level referees could control their emotions effortlessly based on their rich experiences.

Another aspect that affected decision-making was self-belief and confidence level, confidence had a direct impact on decision-making with high credibility and self-authority that they knew they would make the right decision in that split second. According to the SMTQ questionnaire, confidence includes questions such as “I have an unshakable confidence in my ability” and “I have qualities that set me apart from others”, it reflects how confident referees were in doing their job. The scores were significantly different in this component with higher level referees with a mean score of 19.1 compared with lower level referees with mean soccer of 16.2. Higher-level referees were more experienced and they relied on intuitive pattern recognition developed through their experience and practices which enables faster and more accurate decision-making under pressure(Mascarenhas et al., 2005). From research based on referee decision-making, experts detect 23% more infractions correctly than notices in video-based assessments with confidence strongly correlated to decision consistency(MacMahon & Ste-Marie, 2002). Confidence was positively correlated

with consistent decision-making as rugby referees, higher level gained enough experience and they learned from mistakes where they had enough self-belief and confidence that they would make the correct decision, even during high-stakes circumstances. Other than experience, the regular training based on the technical aspect of refereeing could improve their self-confidence as well, because referees could expect what might be coming but not get caught off guard. Confidence affects self-efficacy as a whole but not only decision-making, it gives a positive boost to efficacy including all the components including game knowledge, communication, and situational adaptability. It was an important component of referee efficacy which is positively correlated with each other, with the confidence on the field, strong decisions, and communication will enhance their efficacy in terms of communication and decision-making during the game. Strong efficacy such as rich game knowledge and correct decision making could boost a referee's confidence level time by time as well, research found that they were strongly correlated with each other with the REFS and self-reported confidence levels(Guillén & Feltz, 2011). Other than based on the questionnaires, it could be reflected in the thematic analysis as well. It showed the referee's improvements from a low to a high level of decision-making based on confidence levels. Low-level referees with a lack of confidence need external help and validation as they have fragile efficacy while deciding to make sure they make the right decision. A low-level referee mentioned that during big games when they had assistant referees, he would double confirm their decisions with them but not stand strong to their pictures to make a decision. The lack of confidence leads to shaky decision-making. However, high-level referees, had unshakable self-belief and high intrinsic authority gained from their refereeing career and natural confidence so that they could make strong decisions. A high-level referee who did the Olympics shared that his

confidence came naturally from their self-beliefs since his start of refereeing, he mentioned that” no one challenged me even when I just started refereeing because they know I am right”. It reflects that their strong decision-making partly came from their experience and partly relied on their natural confidence level which not everyone could maintain when they just started.

Decision-making has a huge impact on the refereeing level and it is surely one of the components that separate higher-level referees from normal referees, from the above, confidence and control from mental toughness play a big part in having a positive effect on decision-making. Other than decision-making, the other significant difference in the REFS questionnaire could also be reflected in the difference in confidence and control level.

The other component that had a significant difference between the three groups in the REFS questionnaire was the pressure aspect which asks about the referee's efficacy in facing pressure or their confidence under pressurized situations. Pressure in the REFS questionnaire reflected the referee's ability to stay composed under pressure and regulate emotions like anxiety and frustration. Referees with better emotional control were capable of mitigating stress where they were less likely to make errors under pressure as they were not making panic-driven decisions but stayed composed under pressurized situations to make the correct decision. According to research, referees with thronged emotional control are 27% less likely to make errors under pressure situations(Mascarenhas et al., 2005; García-de-Alcaraz et al., 2020). Positive relations were found between control and pressure where referees were more likely to successfully survive high-pressure scenarios with good emotional control, especially in rugby. At the same time, referees had their regulation reactions to help them maintain emotional control such as deep breathing and cognitive reframing to help them focus. From

the qualitative research, a high-level referee showcases how to stay composed under pressure “I will take a deep breath and make some time for myself to reset during time offs, blank heading watch random things to pull myself out of the heat first, then step back to it to stay focused”. Rugby referees sometimes get into spotlights with all the grey area decision making and they might face harsh criticism at all levels. The other component of mental toughness to help good referees get through this high-pressure situation is confidence. With confidence, referees had the resilience to crises where they could uphold their decision despite external pressure such as player dissent or crowd hostility. Their high self-belief reduces doubts during the decision-making process which they could make faster decisions, and faster decisions without hesitation reducing reduce referee’s cognitive load associated with pressure. A study that also used the REFS questionnaire found that referees scoring high in pressure had 22% higher confidence and 18% higher emotional control than lower scores referees in the REFS questionnaire showing a positive correlation between the three(Guillén & Feltz, 2011). The discussion above based on quantitative research showed the positive relations among the components including confidence, control with decision-making, and how they react under pressure.

Football was also a team sport similar to rugby, as rugby was originally developed from football, and football referees require strong mental toughness as well because grey areas sometimes were even harder to define during a game of football. There was research about elite football referees based on mental toughness and there were some interesting behaviors that were similar to the elite referees in Hong Kong Rugby referees after the analysis of their interviews based on the mental toughness 4 C's model. The research for elite football referees (Slack et al., 2014) separated situations of the game into three phases, pre-

game, during-game, and after-game, and further analyzed their behavior which was quite similar to the qualitative part of this research. One of the most obvious similarities between them and Hong Kong high-level referees was their self-beliefs, throughout all the stages of the game. They had all the trust in their decision and presented the decisions with strong and composed body language to show their confidence. This could be related to the confidence component of rugby referees where they had unshakable self-belief, they believed in their own guts and instincts other than relying on others, it showed that both referees had correlated self-belief and confidence level. The other similarity between them was coping with pressure which could relate to the control aspect in the qualitative research. Elite referees were aware of their own emotions and thrive in the atmosphere of a big crowd before a game. They also block out crowd noises and draw upon their past experiences to deal with pressure during the game. This was similar to Hong Kong high-level referees who adapted their experience to control their emotions as they experienced something similar or even worse scenarios in their career so that they could stay calm and composed during game situations. A high-level referee mentioned that “during the game, I was blank-headed with no emotions and full focus in the game that they heard nothing from the crowds”. They had good emotional control and pressure coping to let them stay fully focused on the game.

One last similarity between them was based on their commitment to their referee job. Hong Kong high-level referees had self-driven excellence where they could learn from different situations and provide feedback for themselves to improve every week even if they didn't do great on the weekend. They mainly focus on their work and goals despite their performance to be the best they can be. As well as football elite referees, tend not to listen to useless feedback such as media rumors or criticism but take on board constructive feedback

from different stakeholders to enhance their further performance. Both referees find ways to improve themselves and are fully committed to their job.

However, one of the points is that Hong Kong rugby referees stand out even more than the elite football referees. Rugby and football nowadays rely on technology sometimes, rugby has Television match officials (TMO) and football has Video Assistant Referee (VAR) to ensure the correct decision through replay. VAR was surely adopted at the highest level in English football, the premier league, but in Hong Kong rugby there was no such thing. Hong Kong rugby premiership referees rely on their on-field decisions and sometimes interference from their assistants to make all the big-time calls under high-pressure situations, even the finals. That requires even a higher level of intrinsic authority and self-belief compared with referees with technology assistance because all the pressure and spotlights will be on the referee, which might also be a game-deciding moment. That's why high-level referees in Hong Kong had a common behavior of believing in their guts which was not as common in other referees. A high-level referee mentioned, "I believe in my guts to make a big call under 5050 circumstances, even if I am wrong, I will just learn from it and make sure I get it right next time."

Therefore, despite all the similarities in the behavior and thoughts between elite football referees and Hong Kong high-level referees, Hong Kong referees might stand out in terms of self-belief with the cliff behind them in every decision.

Further Implementation of research

For further implementation, this research could help different levels of Hong Kong referees to improve. For now, we mainly focus on our physical and referee decision-making aspects which we think could help improve our refereeing the most, their training was mostly

based on fitness and technical level while the mental side wasn't as much. However, this research reflected mental toughness and self-efficacy were positively related to their refereeing level, which means if lower-level referees want to reach higher levels in Hong Kong, they will have to improve their mental toughness and self-efficacy as well, but not only rely on fitness and technical side of refereeing. Hong Kong referees who want to improve their levels to reach higher levels can consider improving their mental toughness to boost their confidence and emotional control to get better at decision-making. There are currently workshops to support mentally, but if the number of workshops increases, the impact on the mental toughness of Hong Kong rugby referees could improve the overall society refereeing level. Concerning this research, the coaching perspective of new referees could also be enhanced. Other than just technical or physical skills, new referees should have a brand new mindset while improving their refereeing. They might consider having their own structured goal setting to face challenges, own ways to control emotions and gain more pressure to build up confidence. This research could give Hong Kong referees ideas of what to improve if they went out of ideas as well as give new referees directions to improve to reach higher levels.

LIMITATIONS

This research project was only based on the Hong Kong rugby referees and the number of them was quite small with only 60 samples with 6 interviewees, so the statistics might not be as accurate. At the same time, the two questionnaires require participants to self-evaluate themselves, both mental toughness and self-efficacy so if they weren't honest, the statistics won't be accurate. Mental toughness and self-efficacy were hard to define with numbers, so the sample from questionnaires was only something that acted as references, and these two both varied among different referees, even the behavior analysis in the qualitative

research part. The research in the future could have more interviews and a larger sample size, considering the small context of Hong Kong rugby referees, the research in the future could include the whole of Asia or some Asian countries with better rugby for example Japan, Korea, or Sri Lanka to give us more insights, as Japan had one of the best rugby level in the world which might even require more from their referees compared to Hong Kong Referees. Japan had a professional rugby league with international players from around the world playing in their league which matches top-tier rugby, the referee efficacy needs to follow such quality rugby to referee in that league in the future Take the Japanese top-tier referee as a reference, the results of the research could be more accurate and reliable.

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