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**Crime Scene Investigators: Exploring the Reasons and Impact
of Career Longevity and Gender Diversity in Forensic Science**

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**Crime Scene Investigators: Exploring the Reasons and Impact
of Career Longevity and Gender Diversity in Forensic Science**

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Abstract

Career longevity among crime scene investigators (CSIs) is a topic for which there has been little research. This is surprising given the increased popularity of this profession as well as forensic science in general. Understanding the profession and the career dynamics of those who serve as CSIs can provide valuable insight which can be used to improve efficiency and effectiveness on the job and promote lengthy and successful careers. This study examines the career longevity of female versus male crime scene investigators and identifies the key reasons behind early departures from the field. The study looks at career inspirations, expectations, and professional pathways for both male and female forensic science students and those already working as career CSIs. Two similar surveys were sent out, one to currently working, and retired crime scene investigators and/or death scene investigators, and one to forensic science students at the University of Central Oklahoma. The sample pool included 45 survey responses from current and former professionals in the field, and 57 responses from forensic science students. From the surveys that were received, we discovered that female crime scene investigators are more likely to leave the profession early than their male counterparts. We identified the various reasons why this was so and formulated suggestions for addressing these issues. We also discovered that the main incentive for students to choose forensic science was because they thought it was an interesting career and they wanted to serve the community in a unique manner, however some apparently did not think beyond this to the demands of the job and the effect it would have on lifestyle and family. From this result, we concluded female CSIs tend to quit the profession early more than their male counterparts and that there are articulable reasons which could be better addressed.

Women in Forensic Science: Exploring the Reasons and Impact of Gender Diversity in Forensic Science

There has been an increasing interest in forensic science because of television. However, the mysterious part about this peaked interest in students and future professionals is the growing number of females and the not-so-great number of male students and professionals in forensic science. Looking at the statistics for the University of Central Oklahoma (UCO), 79% of the undergraduate forensic science students are female and 21% of the program are male (Walcher, 2022, [5]). The purpose of this project is to identify some of the reasons why more women are drawn to forensic science than men and what impact this has on the profession and the career longevity among these professionals. This research will also strive to propose solutions to any issues or special concerns caused by this disproportionate ratio.

In recent years, inclusiveness for women and other genders in forensic science has been tremendously better than before, but certain aspects still need better accommodation. Although there may have been improvements, it is curious what other elements still need to work better to accommodate women and different genders, including men. All forensic science jobs, including lab and field work, should be more accommodating towards all genders with the changing times of today. Educating students about the reality of the working field would help them in the future to know what to expect and what they can do to prepare themselves. This includes learning about the attrition rates within this profession and the reasoning behind why they might have decided to leave this profession or the agency. We are more interested in the reasoning to further help the future professionals. However, the purpose of this study is not to advocate that one gender is better than another or in favor of any gender but to educate and better the current conditions.

Finding out the reasons why students might decide to leave the profession might also aid in understanding future employees and what might affect their decision to leave.

Review of Literature

Women in the Working Field and Universities of Forensic Science

Women make up about half of the US workforce, but interestingly, only one-third to one-fifth of the nation's engineers, chemists, and computer and math professionals are females. There are fields where women make up most of undergraduate and doctorate programs but fail to advance in those careers (Catherine, 2012, p. 9). However, one STEM (Science, technology, engineering, and mathematics) discipline that has attracted many women is forensic science.

In a survey of accredited forensic science educational programs that included undergraduate and graduate programs, 78% were females. Interestingly females with non-forensic science bachelor's degrees ranged from 32%-47% (Houck, 2009, p.65). This is also the case in other nations; the SEMTA or the Higher Education Academy, and the Skills Council for the Science, Engineering and Manufacturing Technologies found an overall rate of 67% females in the forensic science programs in the United Kingdom (Houck, 2009, p.66). In one study done by Marshall et al., in one police organization in Australia, the percentage of women working as crime scene examiners (CSE) was 34%, whereas, in other police organizations, the percentage of women working as CSE was 46% (Marshall et al., 2021, p.6).

Forensic science differs from all other sciences because it intersects law enforcement and science (Barbaro, 2019, p.137). Forensic science has many disciplines within the community, primarily lab-based, and we must wonder if that could be a reason behind the numbers. Forensic science is also very closely related to criminal justice, a male-dominated career, yet we do not

see those numbers in forensic science. In an article by Batton and Wright (2018, p.297), only 12% of officers in local police departments are women; this is not significantly different from the 7% of women that were sworn police officers in 1970 (Diaz). A survey of 387 undergraduate college students also found that women believed female police officers receive less respect from the community than male officers (Cambareri & Kuhns, 2018) (Diaz).

Evaluating Reasonings Behind the Numbers

The University of North Texas, Golden director reported that in 2007, the ratio of female to male students in forensic science programs was 90:10 (Barbaro, 2019, p.138). Women are not entering this field for the monetary value because women are paid 19.5% less than men, according to an article by Dawley et al. (2014, p.72). Some reasons identified by previous research were the influence of female role models, which benefits women by exposing them to successful women in those careers, who have a 'profound' impact on their aspirations because they represent the "possibility of overcoming gender-related barriers to success" (Young et al., 2013, p.284). Another reason was the 'stereotype that science is more feminine than masculine' (Barbaro, 2019, p.138). However, in 1987, according to Sylvia Buffington-Lester, "forensic science was considered a Boys Town, but now it is more like a Girls' World" (Potter, 2008).

Other reasons were "The exposure to the field early on and through 'CSI effect'" and the belief that this field is better suited for woman's needs and interests (Blum, 2017) and their love for solving puzzles (Rachel muenz). Although the "CSI effect" is usually associated with jurors, it also affects everyone who views these television shows related to forensic science. The difference between these two is the effect it has on people, which can be good or bad. In one setting, this effect misinforms and makes people form unrealistic expectations about forensic science during the trial. However, in another setting, this effect inspires and ignites their

curiosity toward forensic science, making them want to pursue a forensic science degree. The influx might also be because of the many lead female roles on television shows. Nevertheless, one thing they might fail to understand is that working at real crime scenes differs from what they might have viewed on television. In conclusion, although the “CSI effect” has the potential to harm, it also has the potential to introduce forensic science to people and help them get a basic understanding of this field.

Longevity

Women are more likely to start a research career now than ever before, according to studies conducted across the world (Sanderson, 2021). Ludo Waltman, who is a quantitative scientist has found from his research that percentage of women that has started a career in science has risen from 2000, when women who had careers in science was only 33% compared to recent years where those numbers has increased to 40% after 2000 (Sanderson, 2021). They are also less likely to continue at the job for the long term due to multiple reasons, including starting a family. Although they are starting their careers in science, it is also seen that they are not progressing to higher roles in the organizations in which they serve (Mckinsey, 2022).

Longevity can be a problem for recruiters in forensic science, where they expect their employees to stay at their organization for a more extended period, considering the amount of money they will be spending on them for their training and other purposes. However, it is also seen that recruiters can predict employee attrition by noting their employment history, stability, and level of education (Viscusi, 1980). However, this is not true of all employees (Viscusi, 1980). Minimal research has been conducted regarding the attrition of women in crime scene investigation and forensic science in general. This makes it difficult to evaluate the longevity of women working in forensic science, especially crime scene investigation, and what agencies

could do to assist them with their needs, like childcare or other issues. Nevertheless, if evaluating the attrition of women in general, it is seen that the rate of women that quit is higher.

It is also observed that the initial period of employment is considered a period of experimentation where the new employees evaluate the job and its working conditions. Women with less than a year of experience are likelier to quit than those with more than one year of experience, but after the first year, the attrition rate for men and women were almost identical. It is also noted that after the first two to three years, the attrition rate of women is less frequent compared to the early years. Furthermore, if job issues negatively affect them, it might encourage them to quit the job. One of the factors that might affect them negatively would be co-worker discrimination. This is seen to shrink the effectiveness of unjust procedures and cause them to quit their current jobs (Viscusi, 1980). While on the other hand, for males, learning-induced quitting helps them stay longer. It is also said that women have a weaker attachment to their jobs and the labor market than men (Sicherman, 1996). Women are also more concerned about current earnings than the training opportunities they might receive while on the job like their male counterparts (race and sex). Another reason that is discussed in this paper is 'not being able to voice their complaints effectively. This is also seen to have been why they might quit the job they deem undesirable (Viscusi, 1980).

Some of the reasons identified in the research were old age, family responsibilities of marriage, pregnancy, and childcare. Attrition behaviors were divided into two categories; 1. They are moving from employment to employment or from employment to unemployment. 2. Moving out of the labor force. The first category describes women quitting a job to get into a better job with a better wage or a job that interests them better. The second category describes women that quit their jobs were motivated by events such as attending to their family, marriage,

pregnancy, childcare, disability, or old age. Another reason that could be a possibility for women to quit their job would be the unavailability of better jobs with better pay and other factors that they might be looking to improve. Lower wages are another reason women tend to quit their jobs more than men. 'People's personal and job characteristics influence the wage rate, and these variables combine to influence quit decisions' (Viscusi, 1980, pg. 390).

Women who are not married are more likely to quit than those who are married since those who are not married might have a change in their marital status, which might cause them to change their migration status and other factors which can also come into play that might encourage them to leave (Viscusi, aug.1980). It should also be noted that quitting to move within the workforce is more prominent for men than women, while exiting the workforce is more frequent for women than for men. Because of this, even though quitting to move within the workforce is more for men, the total attrition rate is more for women because women exit the workforce more than men due to multiple reasons, the most common being household or child-rearing (Barnes&Jones, 1974)

The attrition rates can fluctuate over time, and the effects of COVID-19 are an excellent example of such time. The world was hit by this pandemic, which affected men, women, and other genders. One of the reasons that were given as to why women were hit harder was because of the shutdown in the educational and caring sector. Some sectors would be schools, daycares, and eldercare (Goldin, 2022). However, it is also noted that people with less education were more impacted than those with higher education. (Goldin, 2022).

Since crime scene investigators today are civilian rather than sworn officers, and this might also cause problems they might face other than the ones mentioned above. About 43% of civilians said that there were opportunities for advancement by civilians. About 58% of civilians

said that they had to prove themselves constantly. 40% of civilians said that the officers dismissed their individual experiences and opinions. 43% of the civilians said that the officers often dismiss their expertise. 32% of the civilians said that the employees are treated the same regardless of their status. These statistics give us some insight into some of the obstacles that civilians might face that might encourage them to leave their jobs. However, the only issue with this data is that there is no distinction between male and female participants, so there is no way to focus just on women and how this affects their longevity at the agency or their workplace (Walcher, 2022, [36]). Safety while working is also another concern that was noted in the literature available.

According to an article by Kelty and Gordon, in Australia, the attrition rates at the law agencies are close to 50% over three years because of the exposure to crime scenes and critical incident. It was also reported that 20% of the long-term psychological injury that was caused during the job was due to the exposure to the crime scene. This can cause the professional to resign or leave. Some other reasons stated in this article were the burnout that they might experience due to their job and the stress that accompanies it. This can also cause the development of post-traumatic stress disorder and hence, having a good coping mechanism is what would help them eventually according to research. It is also important for the organization to provide resources and how they can help their employees cope with the stress that they face during their employment.

Work-life balance

Crime scene investigators are individuals that are closely related to the crime scene but their placement within the law enforcement agencies is inconsistent meaning that not all the crime scene investigators have the same educational background, training, or position. Some

crime scene investigators are sworn officers that have been trained how to work a crime scene and others are civil crime scene investigators that are not sworn police officers but have the education and training to work a crime scene. They are called the “silent witnesses” of crimes since they collect the evidence from crime scenes. The duties assigned to the crime scene investigators are also inconsistent, indicating that the stress that comes with the job can vary depending on the responsibilities assigned to them. The stress involved with the profession is based on the scenes they visit and the case backlog and high caseloads at their workplace. (Stress and support). The culture of this field described by Almazrouei in the article as ‘zero error’ is also another factor that affects their stress levels. Other factors that can induce stress would be personal life and financially caused. It should be noted that not all crime scenes are violent crimes and can be minor offenses like property crimes or theft (Barbaro, 2021).

According to an article by Gragnano and others, there are eight dimensions that can affect the work-life balance that professionals might have. Those are: community involvement, romantic relationships, family, household management, leisure, health, education, and friendships. The importance that is given to all these domains differs with each person and or with time. But one domain that stands above all would be health. It is shown that having good health affects the ability of professionals to work efficiently. It is also important to know that all these domains are interconnected and that if one domain is lacking, it might affect the other domains and overall health and performance of the professional. (2020).

The strain that comes with this profession is above average according to the US news and world report. Having to stay at the crime scene and interact with all the factors of the crime can be more stressful and taxing. (Leone & Keel, 2016). This can also affect their personal lives, which can be caused by the standby shifts they must do for them to be available when there is a

crime. Five main triggers that crime scene investigators might be affected by would be the type of victim, the way in which the crime was committed, identifying with the victim, the circumstance of death, and contact with bereaved relatives. The anxiety regarding the possibility of not having recovered all the evidence there was at the scene and doubting one's ability can also affect the mind and later the quality of work that the crime scene investigator does. Lastly, the relationship and cooperation within the department and with other departments can also affect the crime scene investigators and the quality of the work that is produced.

Some effects of extreme burnout can be emotional exhaustion, depersonalization, and reduced personal accomplishment (criminal justice, mental resilience, page 1581). These physical stressors could also be another reason for the attrition rates that we might be witnessing. Even though the crime scene investigators might not be exposed to crime scene too often, it should be noted that being exposed to these circumstances for an extensive period can cause issues that might interfere with their work and might force them to review their working conditions (Leone & Keel, 2016). In a study done, it was shown that female examiners felt more stressed than male examiners. The kind of stress included both workplace stress and stress from their personal life. It is also stated that the difference in coping mechanisms can also cause that stress. Having a shift work model also creates stress according to this article because of how difficult it can be to keep promises and commitments. Individuals who are psychologically resilient have more capacity to cope with major events, catastrophic events, and extreme stress. (Burn out)

But with these conditions, the agencies have also put in measures to ensure that the employees have avenues where they can talk and deal with the stress they might be going through. One of those programs would be the peer support program where the peer supporters have gone through extensive training to give them support if needed. They also provide other

services and support that they might need. Having an outside interest is also what can help them reduce burn out and stress. People that are okay with making mistakes and can move on tend to stay at the job longer than the professionals that have a challenging time moving on from making one (Kelty & Gordon, 2014).

Job Satisfaction

In a study survey gathered by Further, Seltzer, Alone, and Howard (1996) showed that police officers that did not have any graduate school have better job satisfaction than those that do have a post graduate degree. They also found that there was a positive correlation between confidence and job satisfaction. Confidence not just in themselves and their work but also in their colleagues, supervisors, and others they work with.

Another study that was conducted by Zhao et.al (1999), they looked at the effects of multiple demographic factors, which included gender, educational level, and tenure on police job satisfaction. They found that variables like gender and educational level did not have any significant correlation with job satisfaction. All the job characteristics correlated to job satisfaction. The job characteristics included skill variety, task identity, task significance, autonomy, and feedback. The officers that had higher insight to these job skills were more satisfied with their job than the others.

Recommendations

Some of the solutions or recommendations proposed in the research were to start a mentorship program because of its positive effect on women, as this might have the same effect on men in every field (Porterfield, 2020). Some of the other recommendations were enforcing stricter harassment policies and providing victim follow-up, better maternal leave, postnatal care,

and daycare options—helping the rest of the department be aware of the issues women might face (Walcher, 2022, [38&39]). Better female and maternal uniforms and gear were also recommended for better retention (Walcher, 2022, [39&41]). Having a crime scene investigator unit's union, providing safety equipment like vests for civilian workers, and informing the department about the education requirements and the professionalism of the crime scene investigators. Another recommendation was to give civilian crime scene investigators incentives to stay. Having some resources to help women balance their work and family life or have considerations for this. (Walcher, 2022, [41&42]).

In the 2019 NIJ report it states that “One American chief stated that she successfully implemented” (p.17) some of the recommendations above, like the paid birth-related leave for women, six weeks for natural birth and eight weeks for cesarean sections, paid paternity leaves, and permanent shift schedule, saw a positive change in their department. They also noted an increase in the male officer's request for a shift change or day off for childcare duties which was different from the previous years where women had attendance issues due to this reason compared to their male co-workers (NIJ, 2019).

Recruitment

In an article written by Kelty and others, they say that recruitment of the CSIs are also a crucial factor in retention and the reason behind the attrition rates. This article talks about the seven major categories that can help determine if the person is perfect for the role or not. The seven categories were: approach to life and stress resilience, cognitive ability, communication and interpersonal skills, holistic knowledge base, life and work experience, professional demeanor, and work orientation. The article also talks about how having low performing CSIs

can create more stress in the work environment for other professionals on the team (Arin & Nalla, 2015).

Evaluating the applicant on these seven categories, creating a checklist, and creating interview questions that helps the recruiter evaluate the applicant that better fits the role. Having a well-developed recruitment procedure using evidence-based skillsets is highly recommended. Having effective training is even more important in developing the skills shown during the employment stage. Having a well performing CSI will help with higher quality work and better results. Although this is recommended, understanding that you might not find applicants that fit all these categories is important. (Arin & Nalla, 2015).

In an article that was written by Kelty and Gordon, they suggest using a psychometric test that can aid in selecting the most appropriate candidate for the position as a crime scene investigator. They suggest incorporating the test into a five-stage recruitment process (2012).

1. Stage one includes developing a detailed application package which includes asking the applicant about specific specifications, basic and essential qualifications. They recommend setting five or six essential criteria (Kelty & Gordon, 2012).
2. Stage two includes interviews and other behavioral assessments or medical assessments that are done. They suggest developing extremely focused interview questions that can aid the recruiters selecting the candidate. Having a combination of behavioral and standard interview questions can help in understanding their candidates and gauge how they deal with stressful situations or how they might react to conflict (Kelty & Gordon, 2012).
3. Stage three includes the potential applicants taking the psychometric tests in both formats including paper and pencil and the computerized version. This can help recruiters

distinguish who might be who encompass the high attributes required for this job, including being detail oriented. This shows the potential they hold in being a successful crime scene investigator (Kelty & Gordon, 2012).

4. Stage four is where they recommend combining all the information gathered from all the stages. They also recommend a second interview with potential candidates who show inconsistency within the test that they had done previously (Kelty & Gordon, 2012).
5. Stage five is the last stage, including contacting the references provided by the candidate and confirming any other information provided by them. If all the information provided is confirmed, then the successful candidate is offered the job (Kelty & Gordon, 2012).

One thing to note is that not all the departments have the resources to conduct these testing and there might be limitations that can prevent the agencies from taking these steps.

International dynamics in attrition between men and women

In a study done by Utama, it is seen that the percentage difference between men and women is significant even though the number of working women is grouped nationally. One of the reasons specified in the paper is the working hours duration. In the paper, they specified that in a longer working duration of 45 to 59 hours (about 2 and a half days), the percentage of men working increased by 26%. In contrast, the percentage of women working decreased by 14%, but in shorter working periods of 35 to 44 hours (about 2 days) per week, the percentage of women working increased by 11% (2012).

In their paper, they have categorized quitting jobs into two categories. They were shifting in the work field, which is changing occupations, and the other was leaving the work field for multiple reasons, including having children and marriage (Utama, 2012).

Data in STEM

Some of the issue's women experience in the field of STEM that might encourage them to leave or not pursue STEM careers are gender inequalities, gender derogation, increased exposure to sexual harassment and cultural stereotypes. The lack of female faculty in STEM is also one of the reasons that are seen to have discouraged women not to pursue this track. One of the reasons that have affected women's ambitions to be a faculty or pursue the tenure track was motherhood. The traditionally given to women by society and the responsibilities in a workforce might be hard to manage. This is another huge reason some or majority of women in STEM and other departments might be forced to quit early on (Porterfield, 2020).

Fewer women in STEM may also be due to the discouragement they receive along their journey through the education system. It should also be noted that the lack of women and minorities in STEM is not because of a lack of interest or ability but due to the reason mentioned earlier. (Wagstaff&Laporte, 2018). However, it is also interesting to notice the increase in the number of women that are interested in this field and is currently working. We must consider what might have encouraged them to enter this STEM field but no other fields. This is not to suggest that there is not a respectable number of women in other STEM fields. One of the STEM fields with a sizable number of women are psychology, nursing, or any healthcare profession. It would be interesting to know if there are any similarities between the number of women entering these fields. According to an article written by Beede, "out of the 2.5 million female Stem degree holders, 26% held a job in STEM, 14% in education, and 19% in healthcare." It is also noted that the equal number of women and men have entered the 'Asian fields' such as pharmacy and medicine (Diekman et al., 2015, [55]).

Statement of the problem

Forensic science, a trendy and well sought out field of work due to multiple factors, does not have much research related to crime scene investigators' careers, especially female crime scene investigators, and the impact this has on long-term planning. There is minimal research that focuses on the longevity of female crime scene investigators. There is minimal research on this topic, and some solutions could help us understand the trends and associated problems it may lead to for some of these issues.

This research might also assist us in understanding the different struggles between male and female crime scene investigators a produce solution for the problems they present.

The Present Study

Significance of the study

This study about the incredible numbers of female students we see in forensic science is significant because although it has been a subject studied in the among active professionals, there has been little research regarding college students and their reasoning behind their choice. This study can help further educate students and future professionals about the challenges within forensics and what they need to do to prepare. This study will also offer an insight into women's longevity in the workforce, especially in the forensic field, and how that might be incorporated into recruitment. It might also help us clear up any misconceptions that might be present, and that might help us encourage and set a reality check for incoming and current students, which might persuade them change majors if that would in fact be the best course..

Purpose of the study

This study will examine the trends and reasons for the disproportionate number of females to males entering the forensic science field and the impact of that on long-term planning

for law enforcement administrators. It will also examine the reasons behind the peaked interest and enrollment rates for forensic science among female students at the University of Central Oklahoma. The results will assist academics and law enforcement in addressing the pros and cons of the disproportionate field, addressing, and planning for long-term contingencies.

Hypotheses

Research Question One: What are the ratios of female to male forensic science students?

H1. There are more female than male forensic science students in programs across the US.

Research question Two: What are the ratios of female to male crime scene technicians practicing in the field?

H2. An equal number of female and male crime scene investigators are practicing in the field.

Research question Three: What are the longevity rates for female versus male crime scene technicians in forensic science?

H3. Women crime scene investigators have less longevity than male crime scene investigators.

Research question Four: What are the leading reasons for women to leave/quit their position?

H4. The leading reasons why women leave/quit this profession is because of family and gender related.

Research question Five: What can be done to resolve some of the issues that women face in the field that affect the attrition rates?

H5. Changing or adding some programs to the departments might help retain the employee.

Research question Six: How do the career goals of the female forensic science students differ from those of male forensic science students?

H₆. Female forensic science students might prefer careers that are more detail oriented than male students.

Method

The present study will employ an experimental research design to uncover why there might be a surge of female students in forensic science programs and why there might be an increase in attrition rates among female workers. This quantitative and qualitative research will assist academics and law enforcement in addressing the pros and cons of the disproportionate field, as well as addressing and planning for long-term contingencies.

Operational Definitions

This study is directed towards individuals that identify themselves as men and women. However, any other genders identified in the study will also be included. This study is mainly focused on the longevity of women who are crime scene investigators (CSIs). Longevity is operationally defined as the number of years or months an individual worked as a crime scene investigator before they quit. It will be included as a section in the final paper.

Sample/Participants

The first sample for this study consisted of current and retired crime scene investigators in Oklahoma. The target sample size was 100 current and retired crime scene investigators. Forty-five responses were received from the survey that was sent to multiple police departments. Everyone in the sample worked at least two weeks in the agency to estimate participants that might have quit because of reasons not relevant to this study and to obtain participants that have a basic understanding of their job. The second sample set included forensic science students at

the University of Central Oklahoma. The target sample size for this was 100 students. We received fifty-seven responses to the survey that was sent. The participants in this study were required to have completed at least one semester and have a basic understanding of forensic science. All participant submissions were anonymous and participated voluntarily. There were no incentives offered in exchange for participation in the survey. No identifying factors were employed, and the sampling process was completely anonymous.

Data and Procedures

The data for this study was obtained from surveys sent out to current and retired crime scene investigators in Oklahoma, friends and colleagues that have worked in this profession and the forensic science students. The survey was sent out through Qualtrics via email by Academic Affairs at the University of central Oklahoma. The first survey was sent to the forensic science students, and the questions included: 1) Their classification; 2) Their second major; 3) The reason they decided on forensic science as their major; 4) If their view of forensic science has changed; 5) Were their expectations met? If not, why? 6) Would you change your major? 7) What are your career goals? There were demographic questions before or after the above questions. These questions included but were not limited to age, sex/gender, nationality, ethnicity, education level, university, major/s and minor, year and semester of graduation, department, employment, and marital status. The demographic questions were used to differentiate students into multiple categories. The data gathered was manually entered into an Excel spreadsheet and sorted to identify the most common reasons why students chose forensic science as a major and career and if they would choose to change it in the future and categorize participants. The goal was to help us understand why they chose forensic science and if their expectations were met.

The second survey was sent out to the crime scene investigators that are currently working as CSIs for different law enforcement agencies and those who have either retired or quit that position. The survey was divided into three sections. The first section was for someone who had newly joined the agency to know their expectations when they first started the job, how they think it is going, and if their expectations were met or not met. Other questions included where they see themselves in 5-10 years, and general demographic questions such as age, ethnicity, race, education level etc.

The second section included those who have already worked for about five years for that agency. They were asked how their job had progressed, if they are where they expected to see themselves 5-10 years ago, what changed, and where they see themselves in the next 5-10 years. They were also asked basic demographic questions to help categorize participants. Some of the demographic questions included, but were not limited to, age, sex/gender, nationality, ethnicity, education level, major in college, department, employment, and marital status.

The third section was directed toward those who had either retired or quit their job as CSIs. Their questionnaire solicited their title, if their expectations for the job were fulfilled, if their degree was related to the job they had worked, if they have ever thought about quitting, and why they decided not to quit their job. They were also asked what would be some things that they would change regarding their working conditions or any other parts of the job. In addition, they were also asked how many employees they had witnessed quit their job, how frequent it was, and after how many years they had quit. They would also be asked basic demographic questions that included their age, sex/gender, nationality, ethnicity, education level, major in college, department, employment, and marital status. This data was used to categorize the participants, and this was completed manually.

There is data out there that suggests that most women or employees quit after their first or second year at their respective job. That was addressed in the second and third sections of the questionnaires since these respondents would have worked at their job longer than someone that answered the first section of this survey. This assisted in gauging whether the trend applied equally to forensics. An example for this question was “Have you witnessed more women or men quit their jobs as crime scene investigator in the first three years of employment.”

All data collected was anonymous and no identifying questions were asked. The data was stored in Excel and no one else had access to the data. This was to protect the identity of anyone involved. The data will be destroyed after the paper is published and presented.

Results

Quantitative Data – Working professionals.

Due to the nature of the study and how the data was collected, the amount of quantitative data was limited. This had made the analysis more difficult. Throughout this study, the focus was the difference between the career longevity among men and women. A sample t-test was attempted on the questions related to this concern with numerical value but did not yield any useful information.

Frequency analyses were run using SPSS (Statistical Package for the Social Sciences), for several factors. Out of the 45 individuals that participated in the survey, 25 identified themselves as female (56.8%) and 19 individuals identified themselves as male (43.2%). There was one individual that did not identify themselves as either male or female. Out of the participants, 9 reported as single, never married (20.5%), 28 reported as married or in a domestic relationship (63.6%), 3 reported as widowed (6.8%), and 4 reported as divorced (9.1%). One

participant did not provide any input. Out of the 45 participants, 1 reported as being Asian, 2 reported as being African American, 4 reported as being Native American, 35 reported as being Caucasian, and 2 reported as bring other although did not specify.

The age range for this survey varied from less than 23 to 39 plus. Out of the 45 participants, only one reported as being less than 23, 10 reported being between 23-26, 5 reported being between 27-30, 4 reported being between 31-34, 3 reported being between 35-38, 21 reported being 39 or above. There was data missing from one participant regarding age.

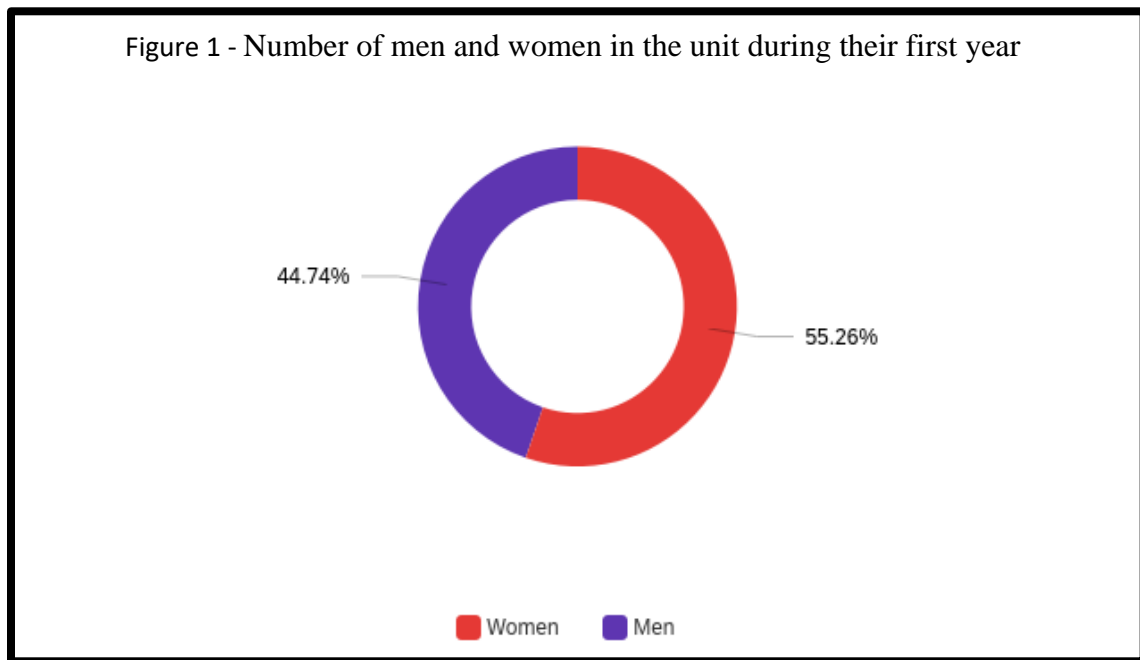
There was an almost equal amount of civilian (20 or 51.3%) and sworn (19 or 48.7%) CSIs among the participants. Most of the participants reported bachelor's degree (26 or 59.1%) as their highest level of education received. Three had an associate degree, 13 had a master's degree, and 2 had a doctorate or higher. Data from one participant was missing. Out of those, 17 got their degree in forensic science, 16 got their degree in criminal justice, 4 got their degree in chemistry/biology, 4 had a dual degree, 10 received various other degrees ranging from accounting to organizational leadership. Most of them decided that they wanted to pursue their career as a CSI after they had started a career in another field (17 or 40.5%) and the second highest percentage of people decided that they wanted to pursue a career in crime scene investigation while they were completing their bachelor's degree (12 or 28.6). Two participants decided that they wanted to pursue this career while they were in elementary school, 9 while they were in middle school, and 2 while they were in graduate school. Input from three of the participants was missing. Twenty-six (26) or 66.67% of the respondents were still working as a CSIs, 5 or 12.82% said that they were retired, and 8 or 20.51% said that they had chosen a different profession. The responses of 6 participants were missing and hence were not considered.

Most of the participants (10 or 9.3%) were within their first three years of employment within their agency or have been working at the agency for more than ten years (15 or 34.9%). Among the other participants, 4 had been employed at the agency for less than a year, 9 had been employed with the agency for more than 3 years but less than 5 years, 1 person more than 5 years but less than 7 years, 2 people more than 7 years but less than 10 years, and 2 people were retired. Most of them are working as CSIs, whereas among the others, 2 of them work as patrol, 19 work in investigations, 12 work at a lab, 2 work in an administrative position, and 6 work as a death scene investigator. The number of participants for this question is more than 45 participants and that could be because of participants starting the survey and not going further than this question.

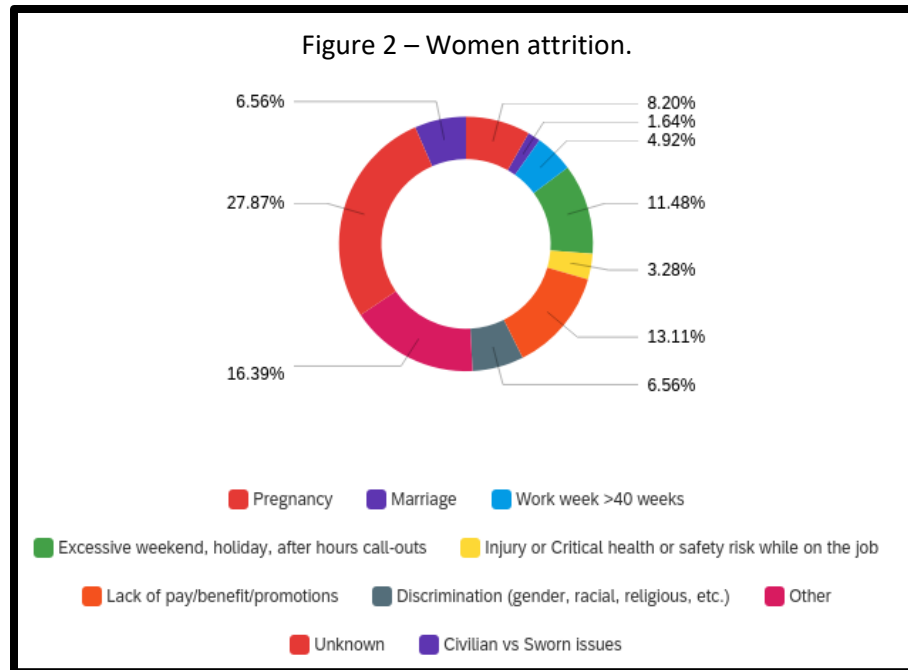
Most of the participants reported that their expectations as CSIs were met (35 or 89.7%) while 4 reported that their expectations of being a CSI were not met. Some of the reasons that were provided as an explanation regarding the negative response was that there was too much politics, the administration made it difficult to do their job, lack of any continuing education, and the lack of promotional or lateral opportunities. Most respondents (30 or 83.33%) reported that they would continue the same job till retirement. Only 6 responded that they would not continue this job until retirement.

The majority of the participants' agencies were medium sized (agency with 70-700 permanent employees) (29 or 70.7%), whereas 7 participants worked in agencies that were large (agencies with >700 permanent employees), and 5 participants worked in agencies that were small (agency with <70 permanent employees). When asked about the ratio of women to men within their crime scene unit, most of the results showed that there were more women than men in most of the units. The most common ratio included one man to varying number of women.

Some of the popular answers were 2 women to 1 man, 10 women to 1 man, and 3 women to 1 man. Similar answers were given when asked about the number of CSI men and women upon starting their job. 55.26% of them said that there were more women than men when they first started working for their unit/agency. 44.74% of the respondents said that there were more men when they first started working at their unit/agency.

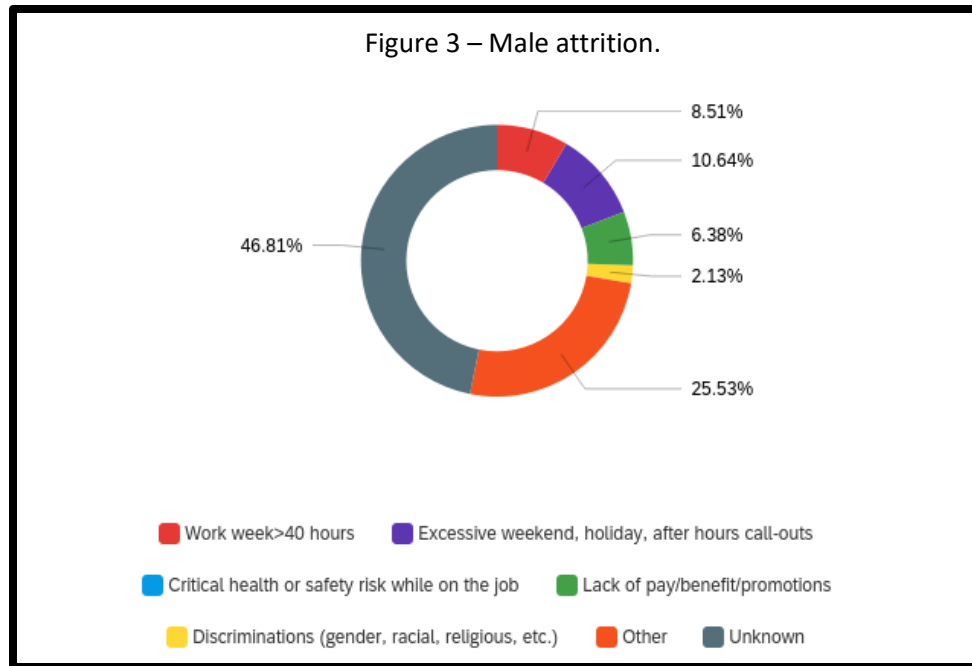


When respondents were asked if they were aware of any crime scene technicians quitting the profession and leaving law enforcement, women were identified as the ones who had quit the most (19 or 48.7%), while 17 of them said that there was no one that had left (17 or 43.6%), and 13 of them said that it was men (13 or 33.3%) who had quit. When asked for reasons for the women's departure, most of them said that the reason was unknown to them.

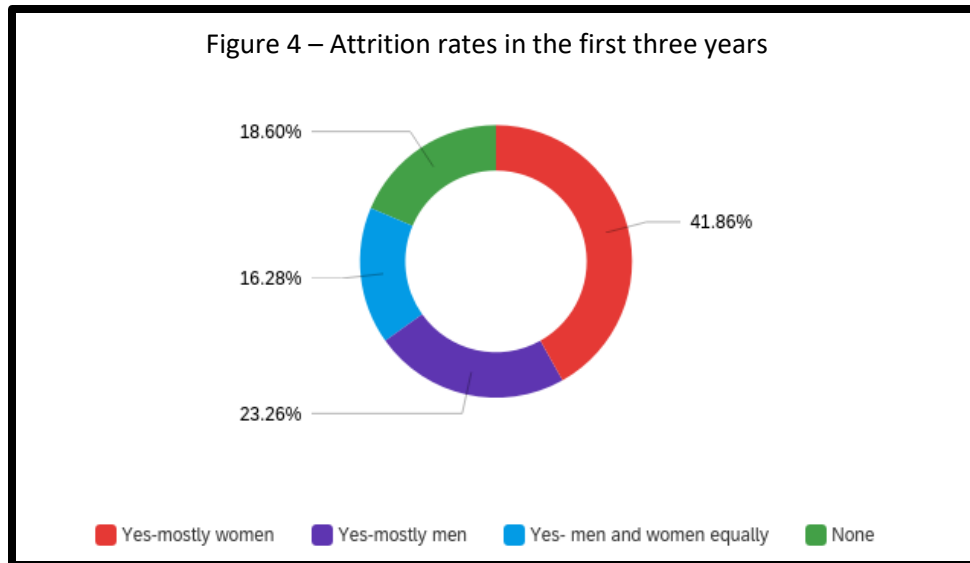


If we look closer, the biggest reason that women decided to leave the profession was that there was a lack of pay/benefit/promotion. Interestingly, contrary to the findings of the literature review, pregnancy, childcare, or family was not the number one reason women left the workforce. It should also be noted that the sample size of this study might not be adequate to come to a definitive conclusion. When asked what other reasons could be responsible for women leaving the profession, some of the more prominent answers were retirement, desire to teach, exposure to death scenes, bullying, and stress. Interestingly these answers contrary to the literature, but it is also important to note that there is minimal research on CSIs and the longevity, and the uniqueness of the career likely explains the different reasons for leaving.

When asked for the reasons why men would leave the profession, the most prominent answer was that it was unknown to the respondent. Other prominent reasonings given were the excessive weekend, holiday, and after-hours callouts. Many of the reasons given for men leaving this profession were intentional to those of women. These reasons included stress, traumatic crime scenes, bullying, lack of inclusion, retirement, or new job prospects.



One of the most curious pieces of information gleaned from the literature review was that individuals who quit their profession or agency do so after the first three years of employment. When asked about this in the survey, majority of them said that there was a greater number of women (18) that quit than men (10). Some responded that there was an equal number of men and women quitting the agency during the first three years of their employment (7). Although gender was not discussed in the literature review regarding this matter, it is interesting to note that there are more people quitting CSI position in the first three years of employment. The reasoning behind this appears to be stress, call-out rates among other factors. Some of these factors can be changed, and some cannot be changed due to the job's nature.



Quantitative data – Forensic science students

Since the study's nature is not quantitative, its analysis is limited. This study had 57 responses. We acknowledge that this study's sample size is not as expected and might affect the accuracy of the results compared to the larger number of populations. Out of the 57 respondents, 5 of them were between the ages of 17 and 18, 13 were between the ages of 19-20, 19 were between the ages of 21 and 22, 7 were between the ages of 23-24, and 9 were above the age of 29. Most of the respondents were of senior classification (18) with first-year students being the second most (12). The number of sophomore and junior students was 8. There was 1 first year graduate student, and 6 second year graduate students. Four participants did not respond to this question.

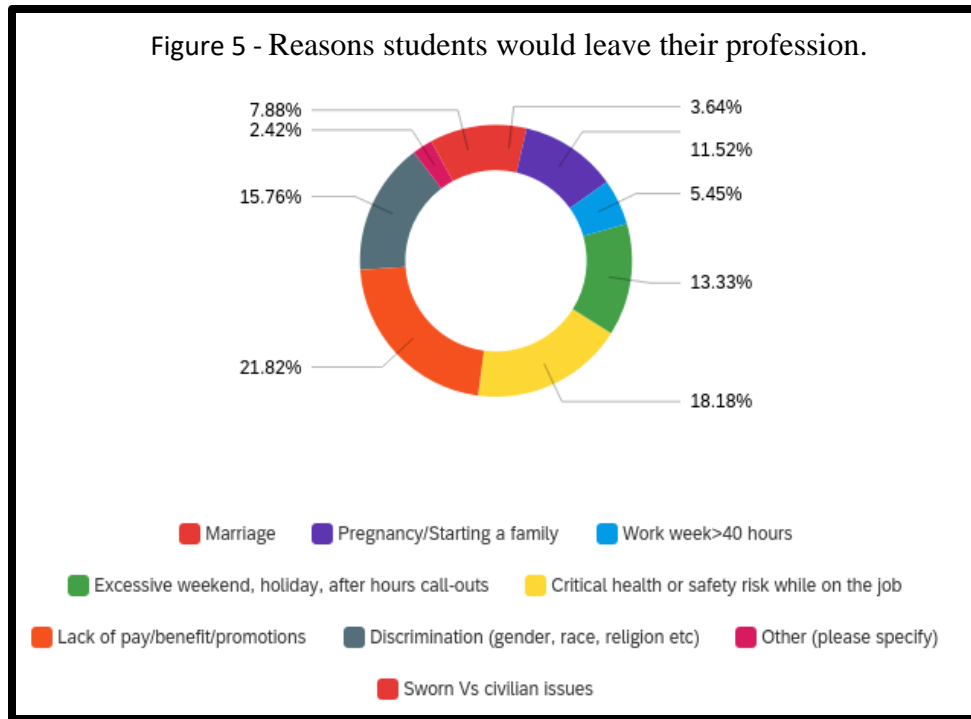
All respondents were forensic science students, with psychology being a popular second major along with criminal justice. Some other popular second majors were funeral services and chemistry. The majority of the respondents were female (48 or 90.57%). There were 2 male

respondents, 2 non-binary respondents, and 1 other respondent that did not identify as any of the above.

When asked about their career goals, most students (14 or 28%) responded that they aspired to be CSIs while many others indicated that they wanted to pursue other jobs that were not specified in the survey. Six of the respondents responded that they wanted to be in non-law enforcement job, six of them were undecided, two wanted to be in other law enforcement job, and four wanted to be a death scene investigator. Some of the other careers included DNA analysts, or some kind of lab work including toxicologist, latent print analyst, forensic psychologist, forensic nurse, or a blood stain analyst.

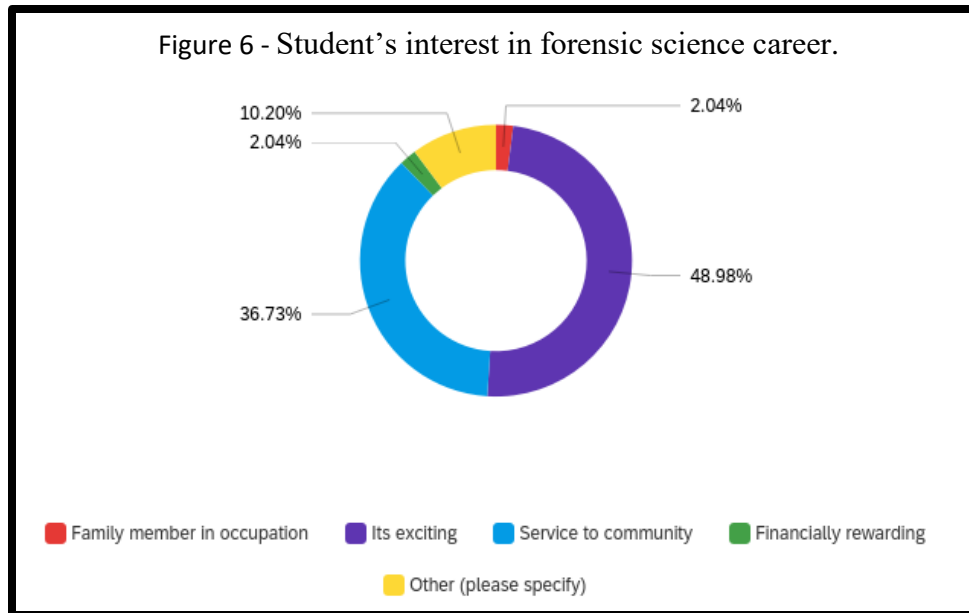
Most of the students (13) expect to be working as CSIs for 3-5 years whereas almost an equal number of students (12) said that they expect to be working in the CSI profession for either 5-10 years or for the entire career. Eight (8) students said they expect to work in this field for 0-3 years, and 5 said they expect to work for 10-15 years.

It was interesting to see that most of the students (36 or 21.82%) would choose to leave the profession because of the lack of pay/benefits/promotions. Another major reason (30 or 18.18%) that was expressed was critical health or safety risk while on the job. Marriage and pregnancy were also another reason students said that they would leave the profession. Consideration should be given to the fact that all the respondents were female students. The answers could be significantly different if more male student responses were included.



Most of the students (48 or 97.96%) did not have any military experience. Nineteen (19) or 38.78% students had police experience, whereas 30 or 61.22% of them did not. Forensic science was chosen as an “interesting major” and was the main reasoning that was given by majority of the students (24 or 48.98%). The second most important reason (18 or 36.73%) given for choosing forensic science was that it was a service to the community. Other reasons included family members in occupation, and financially rewarding. This result was expected as this mirrors what we discovered in the literature review about the influence of television on young minds and the glorification of forensic science and the way it is portrayed in the media.

From the literature review, there is research indicating that women tend to choose forensic science because it is more of a community service job, and they enjoy working jobs that are more caring and involve more attention to detail. Knowing that this survey had more female than male respondents, this is an interesting result that tends to support the data from the literature review.



The expectations that students had before entering college were met by 41 or 87.23% of the students whereas 6 or 12.77% of the students stated that their academic expectations were not met. 36 or 76.60% of the students reported that they would not change their major whereas 11 or 23.405 said that they would change their major. Most of them (44 or 93.62%) also reported that they would recommend this major to someone else, whereas 3 or 6.38% said that they would not recommend this major to others.

Qualitative data – Working professionals

In the quantitative part of the survey, the professional respondents were required to give written answers to justify their answers. Two of the main questions we required them to give written answers to were: 1) when they said they were no longer in the profession and 2) recommendations as to how the CSI profession can be improved in the future. When asked why they decided to leave the profession, answers included that they did not have to be on call anymore, that they had to respond to crime scenes even though they were employed in the laboratory, the hours were hard on them and their family, and that they wanted more opportunity

for growth. When asked why they decided to leave the agency, the responses included retirement; different agency; and wanting more opportunities for growth.

Some of the recommendations given by the respondents correspond with those identified in the literature. Creating a less stressful work environment will tremendously help professionals who are working to have a better-quality life and working conditions, which can indirectly affect attrition rates and quality of work.

The recommendations given by the respondents were similar to recommendations received from individuals in other assignments within the police department. The suggestions included increase in personnel to decrease call out rates, better call schedule, having the opportunity to get counselling when it is needed, more pay, having better staff rotation since there could be people that are less helpful and this also includes supervisory staff, reduction in hours and callouts, receiving compensation for training and certifications, higher pay since the field requires a STEM degree. More community support, more respect from the administration, having an FOP contract like the sworn officers, being able to focus on one role instead of multiple, better turnover with the day shift since seasoned CSI's receive them more than the junior CSIs, and equal pay and benefits for civilians.

Qualitative data – forensic science students

The results of the student survey are consistent with what was expected since we were exploring the reason there might be a surge in female forensic science students at UCO or just the student's sheer interest in forensic science.

When students were asked why they decided to enter a career in forensic science, some of the answers given included a desire to genuinely help people, rewarding career, and exciting and

an interesting way to help people. This indicates that students tend to look for a career that is extremely rewarding and an avenue for them to genuinely help other people.

When asked what their expectations were before entering the program, most answered that they expected it to be hard with a considerable amount of workload. It was surprising to see that few students talked about the television shows that seemed to have influenced others, although there were a few respondents that admitted they chose forensic science expecting it be similar to what was depicted on the television shows like CSI or Criminal Minds. There were also a lot of responses that expressed that they genuinely wanted to learn about distinct aspects of forensic science and how that applied to the judicial system that we have here at the United States. There were also responses indicating that they just wanted a degree or that forensic science seemed to be a “cool” major to study, although no reason was given as to why they viewed forensic science through that lens. Several of the respondents indicated that they were interested in the financial benefits the job would provide.

The suggestions students gave to improve forensic science education were broad. Many respondents indicated that they would not change anything while some of the others wanted more hands-on experience, and more rigid classes. Some also suggested adding more classes including classes that were more specific to certain topics within forensic science. Some recommended additional legal classes, and some suggested that psychology and sociology double-majors have their own route rather than being placed in with the general investigations track. A number of respondents recommended more topics that imparted the real-life impacts that this field would have on them including mental health, job opportunities, and careers, guidance.

Most of the student respondents stated that they would change majors only if forensic science negatively affected their family, mental health, or physical health. Some other reasons that were provided included lack of opportunities, lack of interest, not meeting expectations, not having classes in topics of interest, monetary reasons, superseding interest in another major, or forensic science being too hard.

Limitations

The survey used to conduct this research was created with precision and thoroughness. Even then, there were limitations in this study. Some of those limitations include participants not being honest or not filling out the survey at all. This study is subjective on some levels, and responses might vary due to the uniqueness and differences among departments. The sample size is also a major limitation to this study and could be because there is no incentive to participate in this study. The sample size can be a limitation because when compared to the population, this study might not be considered relevant. Among the data received, 4 specified that they had been working at the agency for less than a year. We chose to include this data because of the limited number of responses received.

Discussion

Violent death scenes are commonplace in forensic science and the people that investigate these crimes are constantly exposed to the unpleasantness surrounding such events. Of course, there are others that aid in this search and conclusion. We have all seen those television shows that show how cool forensic science is and how police can process evidence and solve crimes so quickly. But those who have had worked in this profession and or have studied this major know that it might not be as glamorous as it might be portrayed on television. It is tiring, stressful, and not as fast as we see on television.

One inspiration behind this research and the survey was the alarmingly minimal amount of research that has been done on CSIs and forensic students that choose this career path. It is interesting because the peaked interest in forensic science would lead one to expect more research in this area, not just the science and methodology, but also regarding the professionals that do this work. There are so many factors why there might lead to a higher attrition rate in this field and exploring that will benefit the future and current CSIs in the field and improve their situations and working conditions. It was hard to find any literature on CSIs and attrition rates and that gap in the research was the inspiration for this study.

The uniqueness of the CSI job makes general studies on employment attrition non-applicable. Being a high-pressure job, having research that can help the recruiters understand what kind of a person they need to target for the position and to show students what to expect would benefit professionals, future professionals, and those that recruit and manage these heroes.

This study has multiple limitations as discussed above. All these limitations do compromise the quality and usefulness of this survey. If we had the funding to give the participants compensation, this might have helped in getting more engagement and interest in the study and survey. That could have helped us get to the sample size that we had intended for the study. But even with the limitations, it is good to note that the data does provide some insight into what it looks like with current working professionals. It also gives us a little bit of an insight into the mindset and expectations of students of forensic science.

To further understand the reasons behind the attrition rates and future trends, I would recommend broadening the survey area to more than Oklahoma. Having departments administer an exit survey when CSIs leave would aid the profession in understanding the reasons behind attrition and what we can do to change that. It would be interesting if a survey were done at

every university that offers a forensic science degree including bachelors, masters, or a doctorate or higher. Having that information could help improve the forensic science education and understand the reasoning behind the peak of interest for forensic science. It would also be interesting to know what motivates certain individuals to want to work as CSIs or for a particular agency. This could help educators improve the transition from academics to the field.

The findings from this survey were not surprising because of the recommendations that we had received from actively working CSIs. One unexpected response was the revelation of bullying and lack of respect identified by one of the working CSIs. Having a better system to address unique grievances for both parties would benefit the departments and would also help in establishing better working relationships within the departments. This will benefit the agency and the cases they are working on. This will also help create a better working environment, which will in turn positively affect other concerns such as stress and health.

When we compare both the working professional study and the student study, we discover that both groups do have great passion for this field and want to help people in an incredibly unique way. The reason that we see such attrition rates are mainly because of the call out times and the stress that it produces while working on the job. The working environment and the work relationships they have also affects the quality of their personal lives and must be addressed.

There are factors that can and cannot be controlled some factors which can be controlled and managed are call out times, work week, or lack of pay/benefits/promotion. Factors which cannot be controlled and managed are disturbing scene, and critical health. Giving more attention to those that can be controlled will allow us to improve on those and can aid us in more retention of these professionals. Some surprising responses from this survey were discrimination, and the

sworn/civilian issues that had caused some individuals to leave this profession. These are factors that can be controlled.

In the recommendations received from working professionals, they mentioned more approachable ways to make complaints so that they could sort out the problems they might be facing within the department. One suggestion to manage increasing callouts and more work hours would be to hire more employees or have a better shift schedule. While these suggestions are valid and helpful, we also understand that there might be practical funding issues that might prevent management from implementing these.

There were six research questions that were addressed before the study:

The first research question concerned the number of female and male students' forensic science programs across the U.S. The hypothesis was that there are more female forensic students than male forensic science students. The data received from different universities, which shows that on average, nationally, 78% of students that were enrolled for the forensic science program at the universities were female. This shows that there are more female students that have enrolled in those programs than male forensic science students. Although this data was not received from the survey, it was received from the enrollment data from multiple universities.

The second research question addressed the ratios of female to male CSIs and the hypothesis was that there is an equal number of male and female CSIs. From the data that was collected, we discovered that most of the ratios that were provided by the respondents were that there were more women compared to men. Some of the individual department ratios provided were 10 women to 1 man, 3 women to 1 man, or 2 women to 1 man. There were also answers

where the ratio at their agency was 14 men to 2 women. This negates the hypothesis we had for this research question.

Research question three pertains to the longevity of female vs. male CSIs. The hypothesis for this question were that female CSIs have less longevity than male CSIs. From the data that we received, there was not a significant difference between both sexes. Responses indicated a slightly higher number of women that quit than men in this profession. It is also important to consider the number of responses we received from this survey, as this might affect the accuracy of the numbers. Overall, these smaller numbers support the hypothesis that we had for this question.

Research question four was related to the leading reasons as to why women might leave/quit the profession/position. The hypothesis for this question was that the leading reason women leave this profession was family and gender related. The data received from the survey suggests that the main reason women leave the profession was because of the lack of competitive pay/benefits/promotions. Other prominent answers included excessive weekends, holidays, after hours callouts. This data negates the hypothesis that we had for this question.

Research question five involved proposed solutions that would help negate negative attrition rates. The hypothesis was that changing or adding programs to the departments might help reduce the attrition rates. The results from the survey suggested that an increase in personnel to decrease callouts, reduction in hours and callouts, and better turnover with the day shift. This supports the hypothesis we had for this question but having more programs can also help with retention.

Research question number six addressed the career goals of female forensic science students and the difference from these of the male forensic science students. The hypothesis was that female forensic science students prefer careers that are more detail oriented than male forensic science students. Unfortunately, we did not have enough male forensic science student responses that can help us support or negate this hypothesis. From the female forensic science student responses, most of the students responded that they mainly wanted to be CSIs. Some other popular responses were some kind of lab work, forensic psychologist, non-law enforcement job etc. Most of the respondents of this survey were female forensic science students and this helps us gauge the career goals of the female forensic science students.

While comparing the reason why professionals left the profession and why the students might leave the profession, most of the students said that they would leave the profession if there were a lack of benefits/pay/promotions, whereas the male professionals reported that they left the profession/agency because of excessive weekend, holiday, or after hours call outs other than the two other options, which were 'unknown', and 'other'. When examining the female professionals reasonings, the most popular option except for 'unknown', and 'other', was lack of pay/benefits/promotion.

Conclusion

Attrition rates among CSIs are high and there has been minimal research done on this topic. There is value in understanding the reason behind the attrition rates and understanding why students might be interested in this profession and the reasons why they might consider leaving the profession or the agency that they might be working at. The main question that we sought to answer with this study was whether there were more women that quit this profession than men. From the results that we received, we were able to understand that although there were

more women than men, it was not a significant difference, and we also found an equal number of men and women quit at some agencies.

From the student response survey, we discovered that most of the students wanted to major in forensic science because it was exciting and because this was a unique way for them to give back to the community. It is important to note that students may not fully appreciate the demands of the job and how that can affect the way that they view the job when they eventually go to work. It was also interesting to note that most of the professionals said that they had decided they wanted to be in this profession when they were in college. It would be interesting to know if they had known what the demands of the job were while they were still in college.

References

- Houck, M. M. (2009). Is Forensic Science a Gateway for Women in Science? *Forensic Science Policy & Management: An International Journal*, 1(1), 65–69.
<https://doi.org/10.1080/19409040802629744>
- Catherine Jay Didion, Firhill, L. M., Pearson, W., Stem, I., & Science, I. (2012). *Blueprint for the future: framing the issues of women in science in a global context: summary of a workshop*. National Academies Press.
- Barbaro, A. (2019). Women in Forensics: An international overview. *Forensic Science International: Synergy*, 1, 137–139. <https://doi.org/10.1016/j.fsisyn.2019.06.047>
- Samarji, A. (2012). Forensic Science Education: Inquiry into Current Tertiary Forensic Science Courses. *Forensic Science Policy & Management: An International Journal*, 3(1), 24–36.
<https://doi.org/10.1080/19409044.2012.719580>
- Blum, M. (2017, March 21). *Women In Forensics* [Review of *Women in Forensics*]. Prezi.
<https://prezi.com/uivslvq87fh7/women-in-forensics/>
- Potter, D. (2017, August). “CSI effect” draws more women to forensics [Review of “CSI effect” draws more women to forensics]. NBC News.
- Marshall, H., Julian, R., & Howes, L. M. (2021). Forensic science and gendered organizations: an exploratory study of crime scene examiners. *Australian Journal of Forensic Sciences*, 1–14. <https://doi.org/10.1080/00450618.2021.1937315>
- Dawley, D. D., Houck, M. M., & Gupta, S. (2014). Women, Forensic Science, and STEM: An Initial Inquiry. *Forensic Science Policy & Management: An International Journal*, 5(3-4), 70–75. <https://doi.org/10.1080/19409044.2014.958249>

- Young, D. M., Rudman, L. A., Buettner, H. M., & McLean, M. C. (2013). The Influence of Female Role Models on Women's Implicit Science Cognitions. *Psychology of Women Quarterly*, 37(3), 283–292. <https://doi.org/10.1177/0361684313482109>
- Batton, C., & Wright, E. M. (2018). Patriarchy and the Structure of Employment in Criminal Justice: Differences in the Experiences of Men and Women Working in the Legal Profession, Corrections, and Law Enforcement. *Feminist Criminology*, 14(3), 287–306. <https://doi.org/10.1177/1557085118769749>
- Sanderson, K. (2021, August 5). *More women than ever are starting careers in science*. Nature News. Retrieved April 26, 2022, from <https://www.nature.com/articles/d41586-021-02147-9>
- Wilkins, R., & Wooden, M. (2011). Gender Differences in Rates of Job Dismissal: Why are Men More Likely to Lose Their Jobs? *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1977811>
- Barnes, & Jones, E. B. (1974). Differences in Male and Female Quitting. *The Journal of Human Resources*, 9(4), 439–451. <https://doi.org/10.2307/144779>
- Kip Viscusi, W. (1980, August). SEX DIFFERENCES IN WORKER QUITTING. *JSTOR*, 62(3), 388–398. <https://www.jstor.org/stable/1927106>
- Utama, J. S. A. (2012, August 1). Dynamics of Job Quitting among High Educated Female Former Employees. *International Research Journal of Business Studies*, 5(2), 101–112. <https://doi.org/10.21632/irjbs.5.2.101-112>
- Meitzen, M. E. (1986, April). Differences in Male and Female Job-Quitting Behavior. *Journal of Labor Economics*, 4(2), 151–167. <https://doi.org/10.1086/298098>
- Poterfield, C (2020, October 21). Construct Paper: The Woman-Scientist Identity Interference.

Viscusi, W. K. (1980, October). Self-Selection, Learning-Induced Quits, and the Optimal Wage Structure. *International Economic Review*, 21(3), 529. <https://doi.org/10.2307/2526350>

Blau, F. D., & Kahn, L. M. (1981, July). Race and Sex Differences in Quits by Young Workers. *ILR Review*, 34(4), 563–577. <https://doi.org/10.1177/001979398103400406>

Walcher H. (2022, September 20). *Obstacles and solutions: Women in policing & crime scene investigation* [25-43]. Forensic science, University of Central Oklahoma. <https://docs.google.com/presentation/d/1pISlajbOeHXpEDs2AVBe2w1HFhcxYzf4/edit#slide=id.p1>

Iris R. Wagstaff; Gerald LaPorte, "The Importance of Diversity and Inclusion in the Forensic Sciences," March 8, 2018, nij.ojp.gov:

<https://nij.ojp.gov/topics/articles/importance-diversity-and-inclusion-forensic-sciences>

Starheim, R. P., & Corporate Author National Institute of Justice (NIJ) Address 810 Seventh Street NW, N. I. of J. (N. I. J. (2019, July). *Women in policing: Breaking barriers and blazing a path*. Women in Policing Breaking Barriers and Blazing a Path | Office of Justice Programs. Retrieved October 7, 2022, from <https://www.ojp.gov/ncjrs/virtual-library/abstracts/women-policing-breaking-barriers-and-blazing-path>

Sanderson, K. (2021, August 5). *More women than ever are starting careers in science*. Nature News. Retrieved October 21, 2022, from <https://www.nature.com/articles/d41586-021-02147-9>

McKinsey & Company. (2022, October 18). Women in the workplace 2022. McKinsey & Company. Retrieved October 21, 2022, from <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/women-in-the-workplace>

Sollie, H., Kop, N., & Euwema, M. C. (2017). Mental resilience of crime scene investigators. *Criminal Justice and Behavior*, 44(12), 1580-1603.

- Craven, H. P., Hallmark, M., Holland, F., & Maratos, F. A. (2022). Factors influencing successful coping among crime scene investigation (CSI) personnel: Recruiting for resilience – a mixed methods study. *Journal of Police and Criminal Psychology*, 37(3), 549–568. <https://doi.org/10.1007/s11896-022-09521-x>
- Gragnano, A., Simbula, S., & Miglioretti, M. (2020). Work–life balance: Weighing the importance of work–family and work–health balance. *International Journal of Environmental Research and Public Health*, 17(3), 907. <https://doi.org/10.3390/ijerph17030907>
- Kelty, S. F., Ribaux, O., & Robertson, J. (2023). Identifying the critical skillset of top crime scene examiners: Why these matters and why agencies should develop top performers. *WIREs Forensic Science*. <https://doi.org/10.1002/wfs2.1494>
- Kelty, S. F., & Gordon, H. (2014). No burnout at this coalface: Managing occupational stress in forensic personnel and the implications for forensic and Criminal Justice Agencies. *Psychiatry, Psychology and Law*, 22(2), 273–290. <https://doi.org/10.1080/13218719.2014.941092>
- Diekman, A. B., Weisgram, E. S., & Belanger, A. L. (2015). New routes to recruiting and retaining women in STEM: Policy implications of a communal goal congruity perspective. *Social Issues and Policy Review*, 9(1), 52–88. <https://doi.org/10.1111/sipr.12010>
- Kelty, S. F., & Gordon, H. (2012). Professionalism in crime scene examination: Recruitment Strategies, part 2: Using a psychometric profile of top crime scene examiners in selection decision making. *Forensic Science Policy & Management: An International Journal*, 3(4), 189–199. <https://doi.org/10.1080/19409044.2013.858799>

Arin, S., & Nalla, M. (2015). Understanding the factors influencing job satisfaction of crime scene investigators in Turkey (dissertation).

Leone, M. C., & Keel, R. (2016a). Occupational stress and the crime scene investigator. *Journal of Law and Criminal Justice*, 4(1). <https://doi.org/10.15640/jlcj.v4n1a4>