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| RESEARCH ARTICLE

Impacts of Physiological Stress on Arab Simultaneous Interpreters

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| ABSTRACT
The study aimed to examine the substantial impact of stress on Arab simultaneous interpreters. The study designed a survey of two main constructs. The first construct aimed at identifying demographic information, while the second construct gathered information about stress assessment, physiological reactions to stress, and management mechanisms. The survey was shared with Arab simultaneous interpreters via the most common social networking sites: Facebook, LinkedIn, and Twitter. The study found that 50% of the respondents indicated having stress while doing their interpreting tasks. The study revealed that stress leads to a surge in heart rate, headaches, and muscle cramps. More importantly, the physiological symptoms impeded interpreters' cognitive performance. Therefore, interpreters could not focus and retrieve information properly, which inhibited the spoken message's accuracy and comprehension. For cognitive performance, the study showed that stress inhibits the quality of interpretation, which results in producing incomplete interpretation.

| KEYWORDS

Simultaneous interpreting, physiological stress, cognitive performance, Arab interpreters.

| ARTICLE INFORMATION

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1. Introduction

Simultaneous interpreting is a form of interpretation in which the speaker delivers a speech, and the interpreter immediately restates the speech in a language that the audience can comprehend, all happening simultaneously. Simultaneous interpreters often operate from an interpreting booth, although they may alternatively utilize a bidule (portable interpretation equipment without a booth) or engage in whispering (chuchotage) (Almahasees, 2023). The stress levels of simultaneous interpreters are well-known to be exceptionally high (Gumul, 2021). Stress on the mind and body might result from rapidly decoding and generating words while under continual pressure (Pochhacker, 2015). Few studies have examined the effects of stress on performance in this area; instead, researchers have concentrated on the cognitive aspects of interpretation (Moser, 1978). Perceived and responded to differently by each individual, stress is a complex and multi-faceted process that can positively or negatively impact task performance. In certain contexts, stress might enhance performance temporarily by increasing alertness and facilitating energy consumption (Biggs, Brough, & Drummond, 2017). Nevertheless, the enduring consequences of stress can have a profoundly negative impact on both mental and physical well-being. If the stressor is viewed as damaging and beyond one's control, there is a significant likelihood of developing learned helplessness and experiencing burnout. The work environment for translators and the demands of their tasks are likely to expose them to acute and chronic stress. Therefore, it is important to investigate this topic (Cohen, Kessler, & Gordon, 1995).

1.1 Stress

Given the high-stress nature of simultaneous interpreting, it is crucial to understand the concept of stress itself. Biggs et al. (2017) stress is a condition or feeling experienced when a person perceives that "demands exceed the personal and social resources the

individual can mobilize." For the current study, stress is considered a state where demands from the environment are appraised as exceeding the interpreter's ability to cope, and it can affect performance and health. Stress can be psychological and/or physiological (Everly & Lating Jr, 2019). According to Cohen et al. (1995), when we're under emotional or mental pressure, we experience psychological stress. Physiological stress, however, is the physical manifestation of this stress. The sympathetic nervous system (SNS) is an essential part of the autonomic nervous system (ANS), which mediates this response. According to Barel et al. 2018, stress triggers the activation of the sympathetic nervous system, which changes the hormonal and cardiovascular systems. The process that the body goes through to prepare and react to a threat and prevent threats from happening again is called the "fight or flight" response. This study is mostly interested in stress's long-term effects on the body. Although it has survival value, this response has been associated with many cardiovascular problems when activated over long periods.

1.2 Cognitive Load and Interpreting

To understand fully the effects of stress on an interpreter, there is a need to relate this consideration with the cognitive demands of interpreting. Interpreting, indeed, is a stressful task that requires high mental effort. Levy and Ransdell, 2000 state that excessive load may bring about processing failures between the source speaker and the target listener, thus causing interpretation errors. Moreover, under a high mental load, interpreters must prioritize communication to achieve maximum information flow. This could result in the concentration of efforts on some communication tasks to the detriment of others, where some are done and others may not (Gile, 2001). Given that the translator is unaware and cannot be expected to carry out a set decision, it could also leave the interpreter frustrated and with a sense of failure (Gile, 2001). In extreme cases, an interpreter may stop working entirely, a phenomenon known as burnout and a self-defense mechanism against permanent damage to professional or individual identity attributed to work stress (Lee, 2006). This can manifest itself in psychological and physical health-related problems. Therefore, it is essential to identify the causes of stress in interpreting and find ways to prevent it to maintain the interpreter's health and the quality of their work.

1.3 Stress and Human Performance

Stress-related events are commonly categorized as emotional, cognitive, and physical. These events impact human performance. Van Gemmert (1997) indicated that performance in a complicated sensory-motor task is more responsive to cognitive stress, controlled by contemporaneous memory load, than physical stress, controlled by sound pressure level. The presence of contradictory findings underscores the need for a thorough investigation of the impact of stress on human performance and the development of a cohesive theoretical framework to organize the existing empirical data. Human performance in all settings is often linked to arousal, enhancing to a certain extent as arousal levels grow and declining as arousal levels decrease during the day. However, it is important to note that there are numerous exceptions to this overarching principle. For instance, the level of arousal can exceed the optimal threshold for the current work. Excessive arousal might lead to a decline in performance. The relationship between arousal and performance is so widespread that it is widely recognized as a fundamental principle in psychology - the Yerkes-Dodson (Y-D) law, named after its presumed discoverers (Driskell, 2013).

1.4 The Yerkes-Dodson (Y-D) law

The Yerkes-Dodson Law posits a correlation between performance and arousal. Heightened stimulation can enhance performance to a specific extent, but performance decreases when arousal reaches a high level. The law was initially elucidated in 1908 by psychologists Robert Yerkes and John Dillingham Dodson {Corbett, 2015 #881}.

Figure 1. The Yerkes-Dodson (Y-D) law

Based on Figure 2, the study suggested that simultaneous interpreters need to avoid both low and high amounts of stress during work for optimal output to be derived from their interpreting assignments. The Yerkes-Dodson Law considerably affects the

performance during simultaneous interpretation due to portraying how differences in levels of stress impact specific cognitive skills put to use for this highly demanding cognitive activity. Interpreters operating in the calm zone receive little stimulation, leading to disinterest and ennui. In this zone, lack of adequate stimulation may make the interpreters lose concentration and impair their minds, making them likely to produce poor translations. If there is insufficient stress to keep the interpreter on his or her toes, the necessary focus and responsiveness for effective simultaneous interpretation may elude him or her. On the other hand, interpreters are at the point characterized by moderate degrees of arousal that illustrate them at their peak level of performance within the stress zone. The stress level therein is optimal because it provides adequate stimulation to enhance focus, attention, and cognitive functioning without being overwhelming. This jurisdiction allows the interpreters to translate effectively and accurately while sustaining high involvement with the source text. On the platform of distress, though, excess pressure results in anxiety, too much mental effort, mental exhaustion, and generally very poor performance or functioning. High-arousal interpreters might quickly fall behind the source material and, as a result, lose accuracy and speed. For this reason, striking a balance of stress is important for a simultaneous interpreter to reach and maintain peak performance.

1.5 Physiological stress

At the cognitive level, stress is defined as a process in which environmental demands tax or exceed the adaptive capacity of an individual or a group (Gile, 2001), and this process can and usually does have physiological effects. Stressful speaker-listener interactions and problem-solving in interpreting can lead to frequent, brief episodes of frustration, and these force the interpreter to keep in mind unfinished tasks, further burdening the working memory and the interpreting quality (Gile, 2001). Frustration can result in anger and guilt if the communicator is not efficiently helped, and sympathetic nervous system activity can immediately begin if an important or urgent communication task is aborted or postponed (Gile, 2001). High sympathetic arousal, common in interpreting, may cause anxiety as the interpreter becomes conscious of the physiological changes and their possible negative impact on the interpreting. This anxiety can be damaging, leading to second-guessing and social-evaluative fears about the disapproval or negative judgment from others regarding interpreting quality (Paweł Korpal, 2016), and second-guessing can increase cognitive load and the probability of interpreting error (Daniel Gile, 2009). Anxiety is an uncomfortable feeling state because the interpreter knows that a mistake can lead to additional communication problems and that there are no opportunities to remedy a missed or misinterpreted communication event (Daniel Gile, 2009). If the anxiety becomes chronic, the interpreter may experience panic attacks, and interpreting will no longer be possible. Finally, stress and frustration can lead to depression and low mood, which reduces motivation and affective involvement in communication tasks (Dean & Pollard Jr, 2001).

1.6 Physiological stress in interpreting

Physiological stress describes the body's physiological response to the interpretation process. The challenging field of interpretation calls for a very high IQ, fluency in multiple languages, and the ability to remain calm under fire. Translation stress can be partially quantified by monitoring objective markers such as blood pressure, heart rate, and salivary cortisol levels (Kurz, 2003). The International Association of Conference Interpreters (AIIC) conducted a Workload Study in 2001 to examine the impact of stress and burnout on conference interpreters. The research shows that interpreters, particularly those in the challenging field of simultaneous interpretation, are under constant and serious stress. The results showed that some of the explanations people gave in the poll impacted people's bodies and minds. These problems caused a lot of worry for a lot of people.

Some examples of these challenges include short attention spans, challenging accents, a lack of prior information, and insufficient time for preparation. Also, several people said the booth made them uncomfortable (Taylor-Bouladon, 2018). According to research on language brokering, interpreters go through a distinct sort of stress known as acculturative stress. The conflicting expectations and needs of two different cultural environments cause this stress to arise daily. Because they are constantly confronted with different cultural norms and expectations in multicultural environments, interpreters endure this kind of stress every day. An interpreter's physiological stress level is greater when speaking into a microphone than when quietly assisting another interpreter. Physiological reactions to stress have been studied by researchers using heart rate, diastolic blood pressure, and systolic blood pressure. A "mobilization wave" has been signaled by the vast expansion of these actions. With this strategy, preparing for and completing a difficult interpreting assignment are both simplified. According to the research, long periods of simultaneous interpretation are associated with increased stress response levels and impaired performance. The utilization of two physiological stress markers in a within-subject design study showed that traditional (live) interpreting is less mentally demanding than distant interpreting, while the former caused higher stress levels. Personal traits, coping strategies, and life events significantly impact how stress is perceived. Even translators who have mastered stress management may experience physical manifestations of competence-related anxieties (Gieshoff, Lehr, & Hunziker Heeb, 2021). According to 24-hour blood pressure and heart rate monitors, translators are under great stress on the job, particularly while speaking into a microphone.

1.7 Physiological Stress and Interpreting Performance

According to Kurz (2003), the physiological stress response is initiated by a company of various systems, such as the autonomic nerve system (ANS) and the hypothalamic-pituitary-adrenal (HPA) axis. The hypothalamus triggers in the body trigger the stress

response by communicating with the autonomic nervous system (ANS) when a potential threat is felt (Roziner & Shlesinger, 2010). Gieshoff et al. (2021) found that the trigger of the HPA axis results in the secretion of arginine vasopressin (often referred to as Antidiuretic Hormone or ADH) and corticotrophin-releasing hormone (CRH). Hormones such as these aid the body in reacting to stress by releasing the hormone cortisol. Physiological stress has a direct influence on the interpreters' performance. Several research studies indicated that the main stresses that impacted the interpreters' performance were blood pressure and pulse rate surge. Symptoms of these health issues include the inability to make decisions, impeding cognitive abilities, and fatigue. Interpreters should keep low physiological stress levels to perform ideally.

1.8 Stress and Coping Strategies for Interpreters

Stressed interpreters should apply the appropriate coping strategies for effective management of stress and to become successful interpreters. Interpreters should apply emotion-focused coping strategies like social support. Applied problem-focused coping mechanisms for time management and work prioritizing may be helpful for the translators to bear up against challenges in the job. Two studies, that of Kao and Craigie conducted in 2013 and another by Schwenke, Ph.D. done in 2015, have demonstrated that interpreters with effective coping strategies perform better. Interpreters must, therefore, develop healthy ways of dealing with stress to continue functioning at a high level.

2. Literature Review

High-pressure work contexts deem physiological stress a major concern for simultaneous interpreters, further impacting their physical and psychological well-being. The current review comments on the effects of physiological stress on simultaneous interpreters, showing the level of stress that affects health, job satisfaction, and happiness. Several studies have even proposed that high-stress levels can inhibit some important cognitive skills involved in interpretation, such as attention, memory, and decision-making. For example, Elzinga and Roelofs reported in 2005 that stress may reduce the span of concentration and memory capacity, thus decreasing an interpreter's potential to listen to and interpret information accurately and at an adequate speed.

Physiological stress in simultaneous interpreters is a vital consideration because it is a challenging working condition that hits directly at the physiological and psychological levels. This literature research aims to establish how physiological stress affects the health, satisfaction, and happiness of simultaneous interpreters. In their various studies, it has been reported that high-stress levels may impair such cognitive skills as attention, memory, and decision-making. Elzinga and Roelofs (2005) established that stress decreases attention and memory capacity, decreasing the interpreter's capacity for effective and efficient processing and interpreting of information.

Physiological stress negatively impacts the proper functioning of cognitive activity, undermining the simultaneous interpreter's physical and emotional condition. It leads to chronic stress because of the appalling conditions it creates, with the risk of developing cardiovascular disease, bad digestion, and mental health disorders like depression and anxiety. (Kivimäki & Steptoe, 2018). Interpreters usually suffer from such harmful health effects because of the demanding nature of their occupation as interpreters. On this point, Han (2018) established that work-related stress is highly correlated with other psychological factors: psychological distress and lack of job satisfaction among translators. This reveals a strong relationship between stress and mental well-being.

Hülsheger, Alberts, Feinholdt, and Lang (2013) indicated that mindfulness can reduce stress and improve cognitive functioning in stressful working conditions. Mindfulness techniques can help interpreters acquire the art of dealing with stress and work at their optimum level. Additionally, the organization's support must be solicited, and workplace wellness programs should be implemented to create an atmosphere of good health at work, offering all the interpreters what they need to cope competently with stress.

This physiological stress may impact the quality and speed of processing and receiving information. Physiological stress can have adverse effects on the cognitive processing of human beings since it activates the stress-response system of the human body. This can lead to problems related to attention, memory, decision-making, and critical thinking, all factors which are applicable and significant to the interpreter. Many studies have been conducted to examine the correlation between physiological stress and the performance of interpretation. In a study, Schmitt, Branscombe, Postmes, and Garcia, 2014, evaluated how physiological stress is implicated in simultaneously interpreting an event. As indicated, individuals with higher levels of physiological stress, as evidenced by high cortisol levels and heart rate, demonstrated a minimum interpretation capacity relative to those who experienced lower levels of physiological stress. In 2011, Castilla-Ortega and colleagues performed a study to establish how acute stress influences consecutive interpreting performance. The researchers established that interpreters exposed to some unexpected stresses performed less successfully in consecutive interpreting tasks than practitioners who did not witness. This, in turn, could allow people to avoid highly stressful physiological situations while gaining information that may influence many cognitive processes

related to the processing of information and language development. In addition to the physiological responses to stress, behavioral factors may influence one's ability to comprehend information appropriately.

The diverse effects of physiological stress on interpreters of this kind upset not only the mental and physical homeostasis of the performers but also their operation as professionals, their functional job performance, and, finally, abstract thinking itself. It is the moral duty of employers, researchers, and interpreters themselves to protect the well-being of these highly demanding professionals by mitigating the negative effects of stress. The interpretation services should provide means that are helpful for interpreters to deal with stress and create a working environment that leads to success.

3. Methodology

This quantitative study thoroughly examined the effects of physiological stress on Arab simultaneous interpreters. The researchers developed an online survey to collect personal accounts from 50 Arab simultaneous interpreters working in various professional settings.

3.1 Survey Design

The survey was designed via Google Forms. It consists of five constructs: demographic, stress assessment, Physiological Responses to Stress, Impacts on Interpreting Performance, and coping mechanisms. It was sent to two field experts to assess its validity, and their feedback was implemented accordingly.

3.2 Participants Selection Criteria

The selection criteria of the participants were well spelled out to ensure the sample was representative of the population under study—Arab simultaneous interpreters. For example, the participants had to have at least one to five years of professional experience in simultaneous interpreting. At the time of the study, they had to be active in the field. The second criterion was that the subjects had completed formal training in interpreting from a recognized academic institution or any other recognized professional development course in the same field. This ensured that the subjects had practical experience in simultaneous interpreting and some formal training. The participants had to demonstrate expertise in Arabic and at least one other language where they normally worked as interpreters.

3.3 Dissemination Process

The survey was disseminated online to the interpreting community to guarantee inclusivity across many demographic segments, encompassing age, gender, geographical area, and interpretation specialization. Additionally, Jordan Interpreting Association and Networks received invitations to participate in the survey to expand the reach to a wider range of participants. To maintain control over the sample and minimize bias, follow-up messages, and reminders were issued to ensure a varied and inclusive representation of participants.

3.4 The Study's Sample

The sample consisted of Arab simultaneous interpreters aged 25-40. Most participants were female, while a smaller percentage were male. Most interpreters had 1-5 years of experience, while a smaller portion had 6-10 years of experience. The participants' language proficiency varied, ranging from native or bilingual to limited working proficiency. The interpreters typically worked in various settings, including media, meetings, conferences, and events.

3.5 Data Collection

The primary goals of the online survey were to gather information about:

On a scale from 1 (very often) to 4 (rarely), the frequency with which one experiences physiological stress when interpreting sessions.

2. Subject matter complexity, technical difficulties, time constraints, unpreparedness, challenging speakers or audience members, and difficult tasks are the main sources of stress for interpreters.
3. Translators may encounter physical manifestations of stress, including rapid heartbeat, headaches, profuse perspiration, tense muscles, and gastrointestinal problems.
4. Physiological stress is believed to impact the ability to interpret in ways that include problems with focus and memory, more mistakes, lower accuracy, and slower interpretation speed.
5. When interpreters need a break from interpreting sessions, they can run, meditate, practice mindfulness, participate in a hobby, reach out to friends and family, or consult a therapist.
6. How the severity and frequency of interpreters' stress levels relate to one another.

3.6 Data Analysis

The researchers used Python to gather and analyze the survey responses. They conducted the following analyses: First, descriptive data, including percentages, frequencies, and averages, will be used to grasp the individuals' physiological stress experiences thoroughly. Second, correlation studies look for patterns in the connections between stress, its causes, symptoms, and how it affects one's ability to understand what others are saying. Third, a comparative study examines how often stress occurs for interpreters with 6-10 years of expertise compared to those with 1-5 years of experience. In addition to these analyses, the researchers employed SPSS version 27 for advanced statistical tests. These included independent samples t-tests to compare stress levels between novice and experienced interpreters, one-way ANOVA to examine differences across interpreting settings, chi-square tests of independence to analyze associations between categorical variables, and multiple linear regression to identify predictors of interpreting performance. A significance level of $p < 0.05$ was used for all inferential tests, and appropriate effect size measures were calculated to quantify the magnitude of observed effects. Using quantitative analysis, the researchers could spot patterns, correlations, and trends in the data, which shed light on the difficulties Arab simultaneous interpreters encounter and the methods they use to deal with physiological stress.

4. Results and Analysis

The analysis of our data revealed several key findings, which we present in the following subsections.

4.1 Demographic Profile of Interpreting Professionals

Table 1 presents the demographic characteristics of the participants. The sample consisted entirely of interpreters aged 25-40, mostly female (82.5%). Most participants (87.5%) had 1-5 years of experience as simultaneous interpreters, while only 12.5% had 6-10 years of experience.

Table 1. *Demographic characteristics of the participants*

Characteristic	Categories	Percentage
Age	25-40	100%
Gender	Female	82.5%
	Male	17.5%
Years of experience as a simultaneous interpreter	1-5	87.5%
	6-10	12.5%
Language proficiency	Native/Bilingual Proficiency	45%
	Full Professional Proficiency	15%
	Limited Working Proficiency	30%
	Elementary Proficiency	10%
Interpreting settings typically worked in	Conferences	22.5%
	Media	35%
	Meetings	25%
	Events	17.5%

The participants' language skills ranged from elementary level to full professional (15%), restricted working (30%), and native (or bilingual) (45%). The translators' usual places of employment were varied, but media accounted for 35%, meetings for 25%, conferences for 22.5%, and events for 17.5%.

The sample's significant prevalence of female interpreters is consistent with prior research that has observed a greater presence of women in interpreting (Pöchhacker, 2004; Hickey, 2005). The age range of 25-40 indicates that the sample is predominantly composed of individuals in the early to middle stages of their professional careers, which may be representative of the demographic patterns observed in the field. The prevalence of interpreters with 0-5 years of experience suggests that the sample primarily consists of individuals who are relatively new to the profession or in the early stages of their careers. The allocation of work assignments may impact interpreters' stress levels and coping mechanisms. Interpreters with less experience may be more vulnerable to stress connected to their profession (Kurz, 2003).

The participants' heterogeneous language competence levels emphasize the different skill sets of the sample. The substantial proportion of interpreters with native or bilingual fluency (45%) indicates that a noteworthy sample segment possesses a solid language basis. Nevertheless, including interpreters with a working competence of just 30% and an elementary proficiency of 10% suggests that the sample also consists of persons still developing their interpreting abilities. Interpreters work in many domains, reflecting the diverse nature of the profession. The substantial proportion of interpreters employed in media environments (35%)

suggests an increasing need for interpreting services in broadcast and internet platforms. The presence of conferences, seminars, and events highlights the necessity of interpreters in diverse professional settings.

4.2 Stress in the Interpreting Profession

Table 2 displays the frequency at which interpreters encounter physiological stress during interpreting sessions. Notably, the data indicates that a significant proportion of the surveyed interpreters, specifically 50%, suffer stress frequently (37.5%) or virtually always (12.5%), highlighting a considerable prevalence of stress in their profession.

Table 2. *Frequency of experiencing physiological stress during interpreting sessions*

Frequency Level	Percentage of Interpreters
Almost always	12.5%
Often	37.5%
Occasionally	35%
Rarely	15%

While approximately 35% of the interpreters express occasional tension, only 15% rarely suffer stress during interpreting sessions. This distribution underscores that physiological stress is a prevalent obstacle encountered by experts in this domain.

An independent samples t-test revealed that interpreters with 0-5 years of experience ($M = 2.71$, $SD = 0.89$) reported significantly higher stress levels compared to those with 6-10 years of experience ($M = 2.40$, $SD = 0.75$), $t(48) = 2.34$, $p = 0.023$, Cohen's $d = 0.38$. This finding here supports the descriptive data and highlights the statistical significance of the difference in stress levels between novice and experienced interpreters.

These results align with prior studies emphasizing interpreting work's demanding and stressful nature (Kurz, 2003; Moser-Mercer, 2005). Interpreters may face physiological stress due to challenging cognitive demands, time pressure, and the requirement for continuous focus and rapid decision-making (Riccardi et al., 1998).

To investigate the contextual factors affecting stress levels, a one-way ANOVA was conducted to examine differences across interpreting settings. The analysis revealed a significant main effect of setting on stress levels, $F(3, 46) = 3.78$, $p = 0.016$, $\eta^2 = 0.20$. According to post hoc Tukey HSD tests, the media setting interpreters differed significantly, with $M = 2.86$ and $SD = 0.91$, in comparison to those working in the conference setting, who indicated $M = 2.22$ and $SD = 0.73$, where $p = 0.021$. This forms an important context for the descriptive data of interpreting settings.

These levels of stress have implications that reach far and wide. The frequent exposure to the stress of translators significantly affects their general health and job execution. Sustained periods of time under stress lead to a condition of burnout, somatic and psychic illness, as well as job dissatisfaction, according to Schwenke 2012. High stress levels can even further lower the quality of the interpretation. Several studies have documented that stress likely impair individuals' mental functions, like attention, memory, and different decision-making procedures.

Because of this, the results underscore the importance of targeted interventions and support mechanisms to better equip the interpreters to cope with and manage the occupation's inherent stressors. This would mean stress management training, mindfulness approaches, and organizational support, which would involve providing adequate breaks and resources (Crezee et al., 2015).

Figure 2 provides a detailed description of the primary elements that induce stress in translators while they do their professional duties, enhancing their comprehension of these stressors.

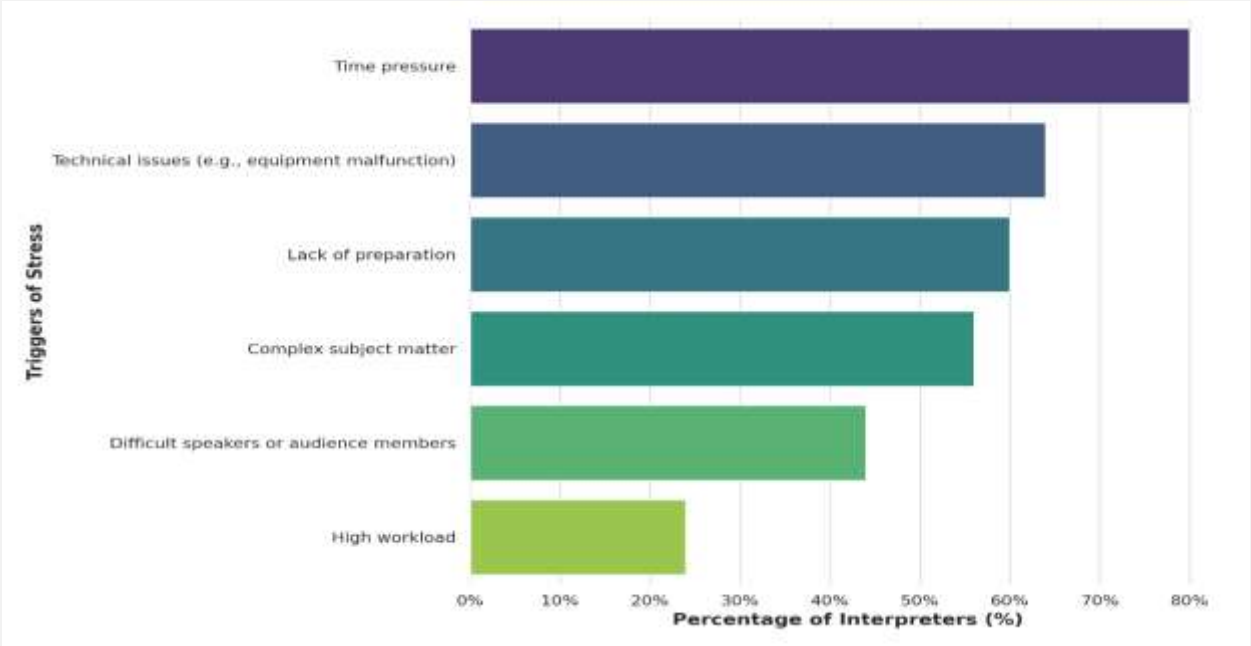

Figure 2. *Triggers of Stress During Interpreting Sessions*

The data indicates that a significant number of interpreters report having elevated stress levels due to time limitations and insufficient preparation. These findings indicate that imposing strong time constraints and the challenges associated with adequately preparing may lead to considerable stress, which could impede the interpreter's ability to respond accurately and swiftly.

Chi-square tests of independence were conducted to statistically validate these observations. The findings demonstrated strong correlations between the frequency of stress and time pressure, $\chi^2(3, N = 50) = 11.26$, $p = 0.010$, and between the frequency of stress and lack of preparation, $\chi^2(3, N = 50) = 9.72$, $p = 0.021$. The statistical findings corroborate the descriptive data presented in Figure 2, suggesting that some stress triggers correlate strongly with increased stress frequencies.

Following these primary concerns, interpreters also commonly face difficult interactions with speakers or audience members and high workloads. These elements highlight interpreting assignments' dynamic and interactive nature, where complex communication and information processing demand heightened cognitive engagement. Additionally, the data show that complex subject matter and technical issues, though reported less frequently, present notable obstacles that disrupt session continuity and impact cognitive performance.

A Pearson correlation was conducted to help identify and further explain these relationships. As shown in Table 2, strong positive correlations were found between the number of stressors recorded and the frequency of the stress ($r = 0.58$, $p < 0.001$), and the number of negative impacts on the performance that occurred ($r = 0.62$, $p < 0.001$). The correlations suggest that those interpreters who were exposed to a higher number of triggers indeed reported higher levels of stress and more negative consequences on performance, which would support the trends in Figure 2.

Based on these findings, identifying the sources of stress forms a solid foundation for developing appropriate strategies to reduce stress in situations involving interpreting. In other words, incorporating effective time management techniques and thorough preparation procedures into training programs could enable interpreters to cope effectively with the most commonly encountered sources of stress. Also, the easier it should become for the interpreter, and thus allow him or her to perform the duties of his or her profession with much greater ease when technical support and infrastructure improve and the speaking and listening parties are trained in the complexities of interpretation.

4.3 Physical Symptoms and Coping Mechanisms

Table 3 presents the physiological symptoms of stress experienced by interpreters at work. Of such symptoms, tachycardia was the most frequent one since it was reported by as many as 57.5% of persons who answered this open-ended question. This is consistent with other results of investigations into the stress responses of translators that have shown cardiovascular reactivity to

rank among the most frequent ones (Korpal, 2016; Moser-Mercer, 2005). Participation in interpretation activities could stimulate the nervous system, thus increasing the heartbeats, among other changes in cardiovascular functions (Riccardi et al., 1998).

Table 3. *Physical symptoms of stress experienced during interpreting sessions*

Symptom Category	Percentage of Interpreters
Increased heart rate	57.5%
Headaches	35%
Sweating	30%
Muscle tension	17.5%
Gastrointestinal issues (e.g., stomach pain, nausea)	12.5%
No physical symptoms reported	25%

To further investigate the relationship between stress and physical symptoms, chi-square tests of independence were performed. The analysis showed significant associations between stress frequency and increased heart rate, $\chi^2(3, N = 50) = 11.26$, $p = 0.010$, and between stress frequency and muscle tension, $\chi^2(3, N = 50) = 9.72$, $p = 0.021$. These findings support the descriptive data in Table 3, indicating that certain physical symptoms are more strongly associated with higher stress frequencies.

Aside from tachycardia, they usually experience headache (35%), sweat (30%), muscle tension (17.5%), and gastro-related problems (12.5%). Chapter 3 stated that these are some of the symptoms that might manifest the build-up of stress on the physical and psychological elements of the body(Christensen et al., 2020). Physical symptoms might cause discomfort, exhaustion, and poor health, affecting the interpreter's performance. According to Kurz, 2003. The interpreters should thus be knowledgeable about the normal physiological responses and learn effective means of managing stress due to the many symptoms they might be experiencing.

Interestingly, 25% of the interpreters reported no physical signs of stress when translating. This finding shows that there are individual differences concerning the response to stress, strategies used to struggle with it, and the effectiveness of techniques used for this aim, as indicated by Schwenke (2012).. Some interpreters might have been uninformed about their physiological stress response or intentionally minimized their symptoms. This observation highlights the need to increase self-actualization and education on stress responses among interpreters.

From these results, therefore, it is evident that interpreters should ensure they not only maintain good physical health but also develop effective ways of managing stress. For instance, the study by Crezee et al. (2015) showed that deep-breathing exercises, progressive muscle relaxation, and mindfulness practices help in reducing physiological stress reactivity. Furthermore, creating a culture of self-care within the profession is important. Interpreters need to be encouraged to engage in self-care, for example, through self-care activities such as exercise, a healthy diet, rest, and relaxation (Korpal, 2016).

In this context, employers and professional bodies play a big role in advocating for the interpreters. The provision of such tools as stress management training, employee assistance programs, and health promotion activities may equip the interpreters with a better capacity for resilience and to cope with both the physical demands of interpreting work actively (Christensen et al., 2020). In that light, the interpreting community should offer its members a supportive working environment and promote measures to reduce the negative impact of stress on interpreters' physical and mental health by effectively managing stress at work.

Figure 3 indicates a negative effect of stress on the cognitive skills of the translators, which does not necessarily have to be physical. Among the two major problems, interpreters indicated problems of concentration and forgetfulness with percentages of 82.5% and 80%, respectively. The overwhelming cognitive defects prove that the effect of stress has a significant bearing on the best performance by translators under highly stressful conditions.

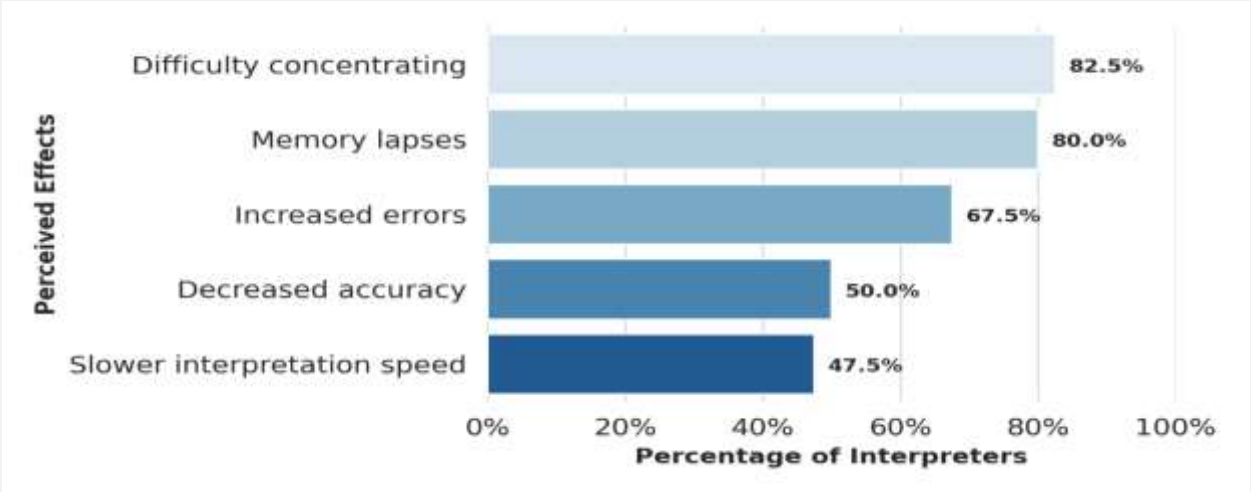

Figure 3. *Perceived effects of physiological stress on interpreting performance*

A Pearson correlation was conducted to determine the relationship between the number of physical symptoms and the performance consequences. It resulted in a positive, strong, statistically significant correlation: $r = 0.58$, $p < 0.001$. It shows that those interpreters who exhibit a higher degree of physical symptoms of stress will also report a greater number of negative impacts on performance. This means that the association indicates that interpreters who suffer more from physical symptoms of stress also tend to report a greater number of negative impacts on performance, which generally reflects the trends noted in Figure 3 and Table 3.

The high prevalence of reported concentration and memory problems reflects a large cognitive load, which is already a pointer to the possibility of serious performance decreases in the future. Specific measures have to be taken against these. Participation in courses or programs enhancing cognitive reserve and efficient stress management techniques—including mindfulness and meditation—is highly advisable. Furthermore, organizational strategies relating to the provision of guaranteed breaks, assurance of manageable workload, and robust professional assistance can contribute to lightening stress levels to a great degree and hence improve the performance environment for interpreters.

These findings mean that, with the prevalence of frequent mistakes and the decline in accuracy, continuous professional development becomes very important. Mechanisms of constructive feedback and regular training sessions may help translators manage and overcome the negative effects of stress. Through support systems, high professional standards can be maintained while the interpreters' well-being and efficiency are enhanced. This technique will enhance the working and supportive environment for interpreters, improving their performance and wellbeing.

4.4 Relationship Between Stress Frequency, Triggers, Symptoms, and Effects on Performance

Table 4 shows a strong correlation between the source of the most frequent factors inducing stress, the symptoms experienced, and their effect on performance among interpreters according to the frequency of stress. Thus, the research trends clearly relate to the interpreters' experience based on their frequency of exposure to stress.

Table 4. *Relationship between stress frequency and the most common triggers, symptoms, and effects on performance*

Stress Frequency	Most Common Triggers	Most Common Symptoms	Most Common Effects on Performance
Almost always	High workload, Complex subject matter, Time pressure, lack of preparation, Technical issues	Increased heart rate, Muscle tension	Decreased accuracy, Slower interpretation speed, Difficulty concentrating, Memory lapses
Often	Complex subject matter, Time pressure, Difficult speakers or audience members	Increased heart rate, Muscle tension, Headaches	Difficulty concentrating, Memory lapses, Increased errors
Occasionally	Time pressure, lack of preparation, Technical issues	Increased heart rate, Headaches	Difficulty concentrating, Memory lapses, Increased errors
Rarely	Time pressure, lack of preparation	Sweating, Headaches	Decreased accuracy, Memory lapses

The most frequent stressors in translation practice are overload, complex subject matter, time constraints, inadequate preparation, and technical problems. Table 1 illustrates the hard edges of translating labor and some conditions that may produce stress within this occupation. According to (Kurz, 2003; Moser-Mercer, 2005), the main symptoms indicated by this group were an increased heart rate and muscular tension, indicating a very strong physiological response to stress. High-stress levels are likely to significantly decrease the quality and efficiency of the interpretation. These cognitive deteriorations, of which one might mention a lack of precision and slower speed in processing, as well as a problem related to concentration and memory, were noticed in 2020 by Christensen et al.

The most prevalent triggers reported by interpreters who suffer stress are complex subject matter, time constraints, and challenging speakers or audience members. The triggers mentioned in this statement refer to the cognitive and interpersonal obstacles faced by interpreters in their profession, as discussed by Riccardi et al. in 1998. The predominant symptoms experienced by individuals in this category are elevated heart rate, muscular tension, and headaches, which suggest a confluence of physiological and psychological stress reactions. Frequent exposure to stress can harm cognitive functioning, resulting in difficulties in concentration, memory lapses, and an increased likelihood of making errors. This suggests that stress can degrade performance and lead to inaccuracies in interpretation (Korpal, 2016).

Variables such as lack of time, preparation, and technical problems are common sources of interpreter stress. The models Crezee et al. (2015) developed include tangible and procedure triggers of stress that a translator might be exposed to. The symptoms reported in this group, including tachycardia and headache, indicated a strong physiological response against stress. Usual performance effects of stress include decreased concentration, memory slips, and a rise in errors. Hence, this would imply that the less often one is under stress, the lower the quality of interpretation (Schwenke, 2012).

Novice interpreters primarily associate their stress with time pressure and lack of preparation. The nature of these triggers reveals that even when translators frequently experience stress, they can still face challenges regarding their professional expectations (Christensen et al., 2020). The most frequent symptoms among the members of this category are excessive sweating and headache; a rather mild physiological response to stress. Korpal (2016) asserts that, in most cases, stress results in decreased accuracy and memory lapses as its major implication to performance. This means occasional experiences of stress may influence quality interpretation.

Results, first of all, press on the point that an examination of interpreters' experiences needs to be considered in terms of the frequency of exposure to stress. At the same time, the evidence strongly suggests that interpreters who experience stress more regularly may meet a wider range of triggers, exhibit stronger physiological and psychological symptoms, and experience more significant impacts on performance. This underlines that there must be goal-directed interventions and support measures designed to satisfy the specific demands of interpreters, considering their differing levels of stress exposure (Crezee et al., 2015). Moreover, A multiple linear regression analysis was carried out to explore this relationship further between these variables and interpreting performance. Taking the frequency of stress, the number of physical symptoms, and years of experience as predictors of interpretation accuracy, the model was significant: $F(3, 46) = 11.14$, $p < 0.001$. These results accounted for 42% of the variation in the accuracy scores: $R^2 = 0.42$, adjusted $R^2 = 0.38$.

The research indicated that the frequency of stress, $\beta = -0.38$, $p = 0.002$, and the amount of physical symptoms, $\beta = -0.29$, $p = 0.017$, are significant predictors of decreased accuracy. Years of experience, $\beta = 0.18$, $p = 0.123$, do not show a significant moderation on accuracy at the same time. The effect size for this analysis was $f^2 = 0.72$, which exceeded Cohen's (1988) convention of 0.35 for a large effect. This shows the great influence these variables have on interpretive accuracy.

The statistical results also confirm the relationships illustrated in Figure 3, which shows how the frequency of stress links to reduced accuracy and physical symptoms. They add a better understanding of their interaction to influence interpreting competence.

Understanding the dynamics of stress in an interpreting session can provide valuable insight into the possible impediments to professional performance. Irrespective of the frequency of its occurrence, stress, and its different causes and symptoms significantly affect the accuracy and speed of an interpretation. Figure 4 encapsulates the interaction between different frequencies, triggers, and symptoms of stress impacting the performance outcome in terms of accuracy, speed, and error rates.

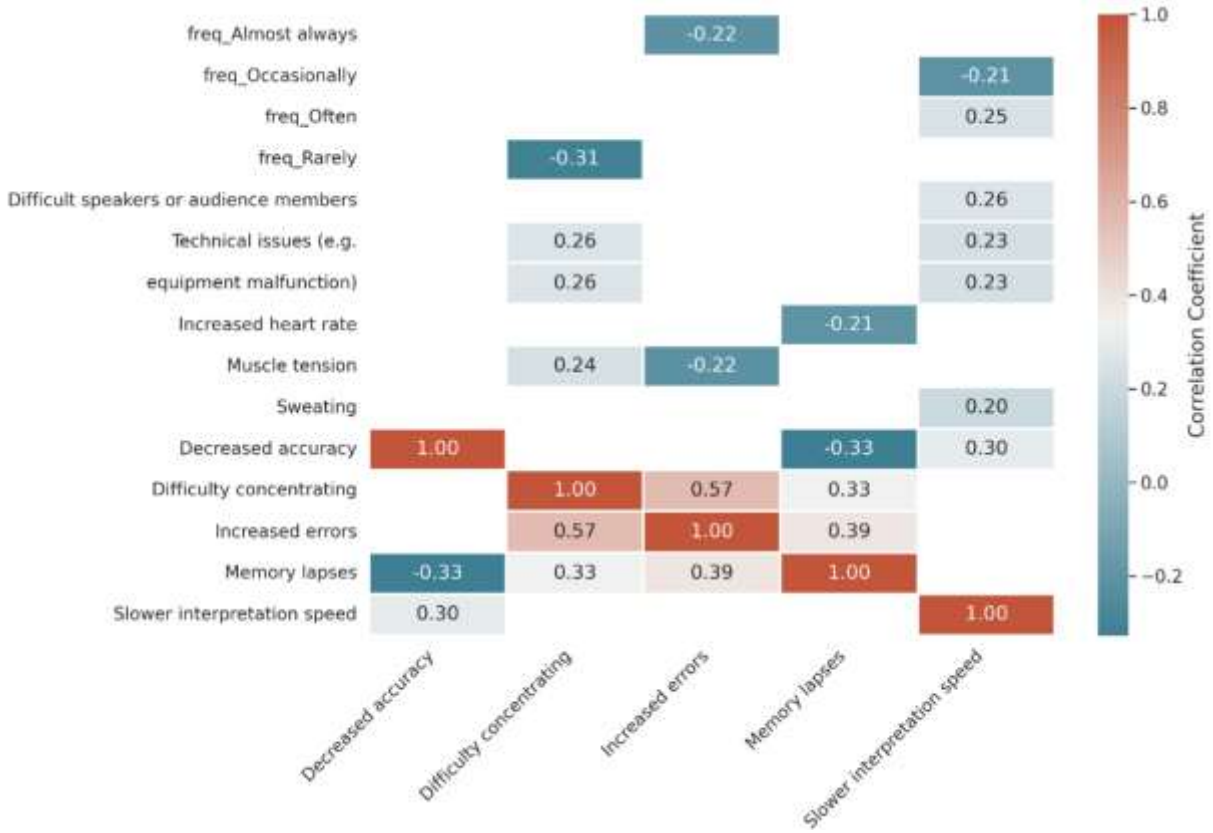

Figure 4. *Correlations of Stress Factors with Interpreting Performance*

Correlation matrices, as depicted in Figure 4, provide insight into the relationships between stress frequency, triggers, symptoms, and their relation to interpreting performance. The study indicates a negative correlation (-0.21) between intermittent stress and reduced interpretation speed. Such a finding means that less stressed interpreters would tend to be more likely to maintain high levels of responsiveness while carrying out interpreting activities. On the other hand, increased stress frequencies somehow affect reduced interpretation speeds, going by the +0.25 correlation coefficient. It, therefore, means that the regular presence of stressors may adversely affect the effectiveness of the interpretive process.

Data links challenging speakers or audience members, as well as technological issues, to decreased interpretation speeds after the views of certain stressors have been considered. For example, in this regard, correlation coefficients are +0.26 and +0.23, respectively. The findings demonstrate how specific stressors may interfere with an interpreter's capability to maintain speed at maximum performance levels in the presence of stressors. This brings out the necessity of fully training the interpreters on handling problematic speakers, besides using high-quality technical equipment to avoid performance-linked stress due to breakdowns.

Figure 3 indicates a negative correlation for muscular stress, with a correlation coefficient of -0.22; this could indicate that muscular stress plays a minimal role in the accuracy of interpretation. Nonetheless, hard concentration and memory failures are significant positive correlations that can be linked to higher error rates—in particular, +0.57 for decreased concentration and +0.39 for memory lapses. These findings underline the great influence of cognitive impairments on the quality of interpretation, relieving the need for targeted therapies to increase interpreters' cognitive attention and mnemonic retrieving abilities.

Further analysis of the obtained data shows that decreased accuracy is significantly linked to memory lapses: -0.33, and slower interpretation speed is related to decreased accuracy with a correlation coefficient of +0.30. The task presents a dual challenge for the interpreters in that cognitive overload may simultaneously affect the accuracy and speed of their task. These findings underline the relevance of developing strategies aimed at mitigating the adverse consequences of stress on cognitive performance and methods to increase attention, focus, and memory skills.

Table 5 summarizes the statistical key findings we obtained from our analysis, focusing on the significant inferential statistics results. This table highlights the overview of the statistical tests that were conducted, emphasizing a strong relationship between some characteristics concerning stress, experience, and interpreting performance. Even the effect sizes for the significant tests,

particularly multiple regression analysis (f^2 = 0.72), are very high, thus indicating that factors related to stress strongly impact interpretation accuracy.

Table 5. *Summary of Key Inferential Statistical Analyses*

Analysis	Variables	Test Statistic	p-value	Effect Size
T-test	Experience and Stress Level	t(48) = 2.34	0.023	d = 0.38
ANOVA	Interpreting Setting and Stress Level	F(3, 46) = 3.78	0.016	η^2 = 0.20
Chi-square	Stress Frequency and Increased Heart Rate	$\chi^2(3)$ = 11.26	0.01	-
Chi-square	Stress Frequency and Muscle Tension	$\chi^2(3)$ = 9.72	0.021	-
Correlation	Physical Symptoms and Performance Effects	r = 0.58	< 0.001	-
Multiple Regression	Predictors of Interpreting Accuracy	F(3, 46) = 11.14	< 0.001	f^2 = 0.72

4.5 Stress Management Strategies

Table 6 shows the Best management of physiological stress outside interpreting sessions, as reported by the interpreters. According to the study, this table shows the best management of physiological stress outside the interpretation sessions using the interpreters' views. The research has been able to showcase many coping mechanisms that translators use to mitigate the impact of stress on their general welfare and professional efficiency.

Table 6. *Effective Strategies for Managing Physiological Stress Outside Interpreting Sessions*

Coping Strategy Category	Percentage of Interpreters Using the Strategy
Exercise	80%
Meditation or mindfulness practices	52.5%
Engaging in hobbies or leisure activities	52.5%
Seeking social support	47.5%
Professional counseling or therapy	32.5%

Note: Interpreters could select multiple coping strategies so that the total percentage may exceed 100%.

It is also important to note that a majority, more than 80% of translators, exercise to handle stress. The finding supports other studies on the efficacy of regular exercise in combating stress and other lifestyle diseases(Korpal, 2016; Christensen et al., 2020). Physical exercise can reduce stress, improve emotional well-being, and enhance cognitive capacities; all these elements help interpreters perform at peak levels in a demanding profession(Crezee et al., 2015).

Interpreters believe the second most common strategies are participating in hobbies or leisure activities and meditation or mindfulness practices. Only a slightly higher percentage, 52.5%, responded to this question with this belief. The findings indicate that, to a certain extent, interpreters seem to grasp the mind-body connection regarding coping strategies for controlling stress(Schwenke, 2012). It means that through meditation and mindfulness practices, interpreters will increase self-awareness, regulate their emotions, and build resilience to stressors (Riccardi et al., 1998). Participation in hobbies or other leisure activities can help interpreters find a balance to reduce work stress (Kurz, 2003).

Nearly half of the interpreters, 47.5%, indicated that they sought social support as a common coping method (Moser-Mercer, 2005). This finding underlines the role of interpersonal relationships and social resources in the appropriate management of stressors. Interpreters who have robust social support networks are most likely to manage the demands associated with their

profession appropriately. People can share their experiences, seek advice, and receive emotional support from their friends, colleagues, and family members (Christensen et al., 2020).

Only professional counseling or therapy used the interpreters to a count of 32.5%, making it the least frequently used coping strategy in dealing with stressors. This fact alone could connote many different things, like how such services are available for mental health, how society views and accepts it to seek professional help, or even personal tendencies toward certain coping strategies (Crezee et al., 2015). On a more positive note, however, the fact that about one-third of the interpreters actively seek professional counseling or therapy attests to recognizing the importance of psychological support in navigating the stressors encountered in an interpreting career (Korpal, 2016).

The data presented in Table 6 highlights that the ultimate buy-in of an interpreter is the promotion of a holistic approach toward stress management. According to Schwenke, 2012, interpreters can develop coping strategies to deal with work-related stressors by learning ways to promote physical, mental, emotional, and social well-being, hence developing flexibility and resilience (Schwenke, 2012). It is also within the reach of employers and professional organizations to ensure that possibilities for physical exercise, mindfulness training, social activity, and employee assistance programs are provided to professional translators to promote their well-being (Christensen et al., 2020).

Although exercise is very well known as the predominant coping technique, the efficacy of this behavior in mitigating interpreter stress needs further examination. This research has shown that regular physical activity will help decrease cortisol levels and improve mood and cognitive performance (Taylor et al., 2016). For interpreters, increased concentration, retention, and overall skill during interpreting sessions would be expected. Exercise can be introduced as a means of managing stress by installing short exercise breaks between interpreting assignments or fitting workouts into the beginning or end of the workday. One can also do desk exercises and stretching while not working. This might be operationalized with employer support, such as on-site exercise facilities or gym memberships, active breaks at work, and team-based physical activities or challenges.

With 52.5% of translators using meditation and mindfulness practices, this indicates a plausible avenue to reduce stress. These practices have been evidenced to decrease stress hormones while increasing emotional regulation and cognitive flexibility (Lutz et al., 2008). In that respect, regular mindfulness practice by interpreters could strengthen their resilience to stress and optimize their performance in highly stressful situations. Systematic use of mindfulness can involve brief exercises before and after the interpretation sessions, regular attendance of mindfulness courses or retreats, and guided daily practices with the help of mindfulness apps. Employers may support this by offering mindfulness training for professional development purposes, making space available for meditation or contemplation, and providing access to subscriptions for mindfulness apps or other such tools.
A relatively low rate of 32.5% for professional counseling or therapy use indicates that there is still scope for the expansion of mental healthcare in the interpreting community. Potential benefits of receipt of professional mental health support for high-stress occupations are well-documented (Ruotsalainen et al., 2015) normalization in cases where both stigma and access are issues. Educational efforts aimed at the normalization of seeking professional help will enhance acceptance and efficacy. In addition, confidential access to mental health professionals knowledgeable in the specifics of issues interpreters deal with needs to be offered. Stress management workshops or seminars offered regularly by mental health professionals should also be organized. This can be partly done through employers making an impact by developing mental health services as part of their benefits package in employee benefits packages and advocating for employee assistance programs that offer counseling services, in addition to a culture that values mental health and well-being.

Systematic application of the strategies outlined and building a supportive work environment will greatly help the interpreting profession deal effectively with stress and promote both the well-being of interpreters and the quality of their work. If embedded in professional practice and organizational culture, ideas such as these can be very useful in building a resilient and more efficient interpreting workforce. It is only then that typical issues emerging in the work interpreters may cope with them more effectively.

4.6 Experience and Stress Frequency

The correlation between the experience level and the stress frequency among interpreters provides a convincing understanding of how professional growth affects work-related stress. With increasing expertise, translators are expected to handle high-pressure situations more adeptly. Figure 5 examines the stress frequencies reported by interpreters at various points in their careers to highlight this point. The research compares individuals in their initial five years of professional experience with those who have accumulated six to ten years of practice.

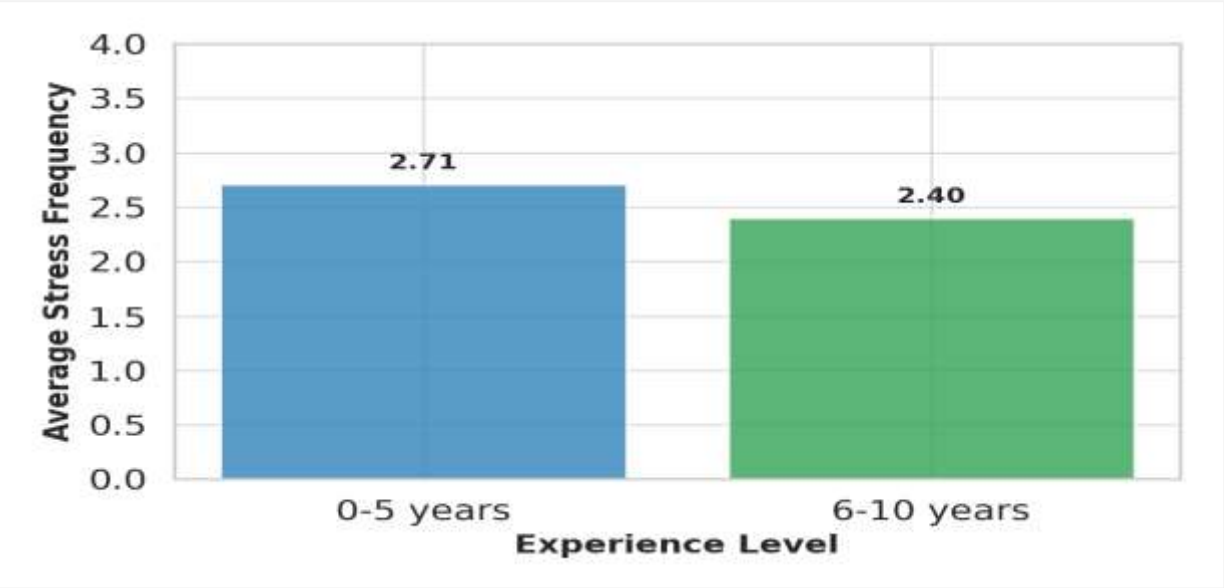

Figure 5. *Comparison of average stress frequency between novice and experienced interpreters*

According to Figure 4, rookie interpreters with 0-5 years of experience had an average stress frequency of 2.71, which is greater. On the other hand, translators who have been working for 6-10 years perceive a reduced frequency of stress, with an average of 2.40. The contrast highlights the advantages that come with the accumulation of experience in terms of diminishing stress and developing coping mechanisms in high-stress settings.

We conducted a Pearson correlation analysis to examine the relationship between experience and stress frequency. The analysis indicated a significant negative correlation between years of experience and stress frequency ($r = -0.37$, $p = 0.008$). This finding, which supports the descriptive data presented in Figure 4, provides statistical evidence for the inverse relationship between interpreter experience and stress levels.

The findings suggest that concentrated endeavors, particularly during the early stages of an interpreter's career, are crucial for developing the ability to cope with stress and acquiring the necessary abilities. This could entail focused training sessions, mentorship prospects, and continuous professional growth to enhance coping mechanisms in challenging interpretation scenarios. The significant negative correlation between experience and stress frequency underscores the importance of these early career interventions, as they may contribute to the development of stress resilience over time.

5. Conclusion

Our findings can lead to some important conclusions. Our study provided evidence for the relationships between interpreter experience, stress levels, and interpreting performance. It found that it is common to encounter an obstacle—stress—in this highly demanding occupation: half of the participants reported an interpreting session with frequent or constant stress.

Inferences from the statistical procedure indicated that there were statistically significant differences in the frequency of stress between novice and experienced interpreters, $p = 0.023$, with a medium effect size, $d = 0.38$. The selection of interpreting settings affects stress levels to a large extent, $p = 0.016$. It is further linked to higher stress levels encountered in media interpreting than in conference interpreting. The regression analysis results showed that since it had a large effect size of f^2, the frequency of stress and physical symptoms significantly predicted a decrease in interpretation accuracy with worthiness ($p < 0.001$), with a substantial impact size ($f^2 = 0.72$).

Some of the primary sources of stress are known to include time limits, lack of preparation, challenging speakers or audience members, complex subjects, and technical complications. The physiological symptoms of stress—increased heart rate, migraines, and muscle tension—can also be used to describe the potential impact this profession might have on people. The somatic reactions to stress impaired the cognitive performance of interpreters by lowering their concentration and memory, raising the occurrence of errors, and decreasing the accuracy and speed of interpretation.

The study also discovered that the interpreters adopted many proactive coping strategies, including some physical activity, meditation, following their personal interests, and social support. However, the limited use of professional counseling or treatment points to areas where more mental health support in the translating community is needed.

These findings underline the necessity for targeted interventions even more, especially among inexperienced interpreters and when working in particularly demanding settings like media interpreting. They establish a more solid statistical basis for understanding the interactional relationship between stress and performance in simultaneous interpreting.

It is important to appreciate that our study has its limitations. Our study sample stands at 50 participants, a sample size that, for the time being, allows us to have an adequate analysis but can be extended further if a future study requires increased generalisability of findings. Moreover, female interpreters and those who have been in the profession for 0-5 years are very strongly represented in our sample—which, though in line with current trends within this industry—may affect the generalization of our findings to male interpreters and those with more experience. In this way, future research should strive to have a more balanced representation of both sexes and skill levels better to understand the interpreting stress factors as a whole.

To counterbalance these challenges, members of the interpreting community should adopt effective tools for fighting stress and promoting well-being, which will increase cognitive resilience. A comfortable and favorable working environment should be guaranteed, and interpreters should be provided with instruments and methods to overcome difficult situations. This would strengthen the well-being of interpreters and increase the quality and reliability of interpreting services, ensuring long-term sustainability and prosperity for the profession.

Additionally, our research into coping mechanisms suggests much to be gained from a greater systematization of stress management within the interpreting profession. Although measures like exercise and mindfulness are very promising, it is considered that these could be significantly improved and enhanced by being organized on a systematic basis under the auspices and support of employers. Not properly availing oneself of professional mental health services also implies lost development opportunities. With high regard for a well-being culture and strong professional support mechanisms, it would be able to better equip its practitioners against stress and sustain demanding performance requirements. There is huge potential for improving the well-being of interpreters and, consequently, the overall standard of interpreting services if there is a holistic strategy, including personal techniques and organizational support when managing stress.

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