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A RESEARCH ARTICLE

Healthcare Provider Perspectives on Anesthesia in Down Syndrome: A Cross-Sectional Study in Benghazi, Libya

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Abstract

Background: Patients with Down syndrome (DS) present unique anatomical and physiological challenges that require specialized anesthetic management. This study aimed to evaluate the knowledge, attitude, and perception (KAP) of healthcare providers regarding anesthesia for DS patients in Benghazi, Libya. Methods: A descriptive cross-sectional study was conducted from January to December 2025 across the Benghazi Medical Center (BMC) and local rehabilitation centers. A pre-validated, three-section questionnaire was administered to assess demographics, knowledge, attitudes, and concerns. Results: The study included 51 healthcare providers, predominantly anesthesiologists (63%). While 86.3% of participants were aware of the increased risks of bradycardia and hypotension during anesthesia induction , 60.8% reported having no specific training in managing patients with special needs. Airway management was cited as the most significant clinical challenge (60%). A vast majority (94.1%) agreed that DS patients require tailored anesthetic protocols , and 90% expressed a strong need for additional training. The primary barriers to safe care were identified as a lack of experience/training (35%) and a lack of specialized equipment (24%). Conclusion: Healthcare providers in Benghazi demonstrate adequate foundational awareness and a positive attitude toward specialized care for DS patients. However, significant gaps exist in formal training and access to specialized equipment, highlighting the urgent need for targeted educational programs and institutional protocols

1. Introduction

Down syndrome (Trisomy 21) is the most common chromosomal anomaly globally. Patients with Down syndrome frequently require surgical, dental, or diagnostic procedures under general anesthesia throughout their lifespan [1]. However, providing anesthesia to this population is fraught with unique perioperative complexities. Anatomical features such as macroglossia, tonsillar hypertrophy, micrognathia, and subglottic stenosis dramatically increase the risk of difficult intubation and airway obstruction [2]. Furthermore, prevalent systemic comorbidities—including congenital heart defects (e.g., atrioventricular septal defects), pulmonary hypertension, atlantoaxial instability, and an exaggerated vagal response leading to profound bradycardia upon induction—demand meticulous perioperative planning [3].

Despite the well-documented risks, literature evaluating the readiness, knowledge, and perspectives of healthcare providers managing these vulnerable patients remains limited, particularly in developing regions [4].

In Libya, systemic challenges such as equipment shortages and a lack of updated local clinical guidelines may further complicate the anesthetic management of patients with special needs.

This study aims to assess the knowledge, attitudes, and perceptions (KAP) of healthcare providers in Benghazi regarding the specific effects and challenges of anesthesia in Down syndrome patients. By identifying current educational gaps and perceived clinical barriers, this research seeks to provide an evidence base for implementing targeted training programs and establishing safer, specialized perioperative protocols.

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2. Materials and Methods

2.1. Instrument and Study design

A descriptive cross-sectional study was conducted using a three-part questionnaire. Section 1 collected demographic data through 12 questions, Section 2 assessed knowledge and attitudes, and Section 3 evaluated perceptions and concerns. To ensure content validity, the initial draft was reviewed by three clinical practitioners, and their feedback was incorporated into the final version.

2.2. Study Setting and Duration

Data collection took place over a 12-month period, from January to December 2025, at the Benghazi Medical Center (BMC) and various rehabilitation centers across Benghazi.

2.3. Study Population and Criteria

The study population comprised healthcare providers currently employed at BMC or the targeted rehabilitation centers. Healthcare professionals working outside of these specified facilities were excluded. In total, 51 responses were successfully collected.

2.4. Sample size

The sample size was 51 participants. While this number reflects the accessible population of specialized providers at BMC during the study period, it is recognized as a pilot-scale sample. Given the highly specific nature of anesthesia for DS in this region, this sample represents a substantial portion of the local specialized workforce.

2.5. Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee at College of Medical Technology, Benghazi (Approval No: CMT 0020261548996). All participants (n=51) provided informed consent prior to completing the questionnaire. Data confidentiality was strictly maintained, and no personal identifying information was disclosed.

2.6. Data analysis

All statistical analyses were conducted utilizing SPSS software, version 25. For the knowledge assessment, responses were coded dichotomously: correct answers received a score of 1, while incorrect or "unsure" responses were assigned a 0. Overall knowledge levels were then classified using Bloom's cut-off criteria, defining scores of 75% or higher as "Good Knowledge" and scores below 75% as "Poor Knowledge."

Attitudes were evaluated using a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"). A total attitude score was generated by summing the responses across all items, with higher cumulative scores reflecting a more positive attitude toward Down syndrome. Descriptive statistics, specifically frequencies (N) and percentages (%), were used to summarize categorical variables such as demographics and KAP classifications.

3. Results and Discussion

3.1. Results

3.1.1. Section one: Demographic Data

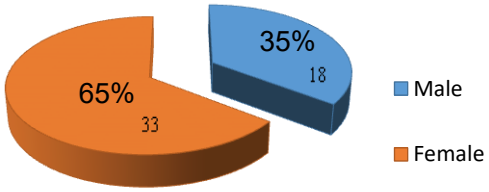

Figure 1. Distribution of HealthCare Providers according to Gender

Figure 1 represent that, among the 51 healthcare providers included in the study, females constituted the majority of the sample (65%, n = 33), while males accounted for (35%, n = 18). This distribution reflects a higher representation of female healthcare providers in the study sample.

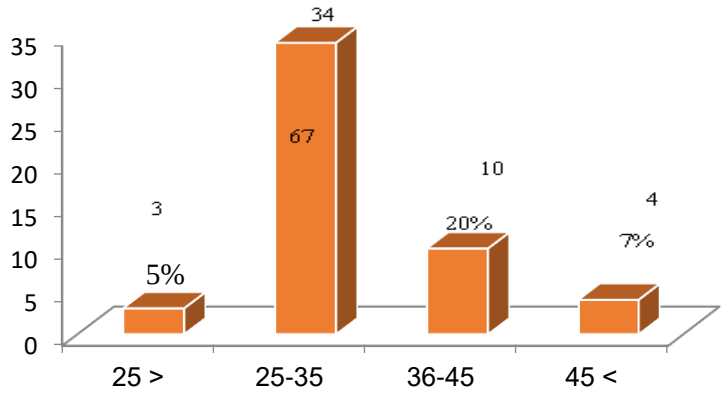

Figure 2. Distribution of Healthcare providers according to Age

Figure 2 showed that, the majority were aged between [25-35] years (66.7%, n = 34). Participants aged [36-45] years accounted for (20%, n = 10), while smaller proportions were Less than 25 years (5%, n = 3) and over 45 years (7%, n = 4). Overall, the sample was predominantly composed of young to middle-aged healthcare providers.

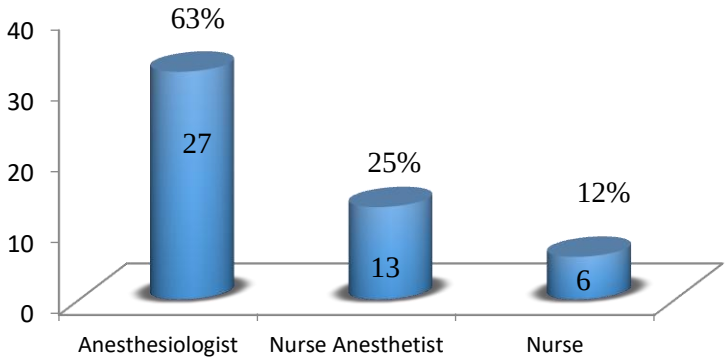

Figure 3. Distribution of HealthCare Providers according to Profession

In Figure 3 it is clear that, the majority of participants were anesthesiologists, accounting for 63% of the sample. Nurse anesthetists represented 25%, while nurses constituted the smallest proportion at 12%. This distribution indicates that the study sample was predominantly composed of anesthesia-related professionals, which is appropriate given the clinical focus of the study.

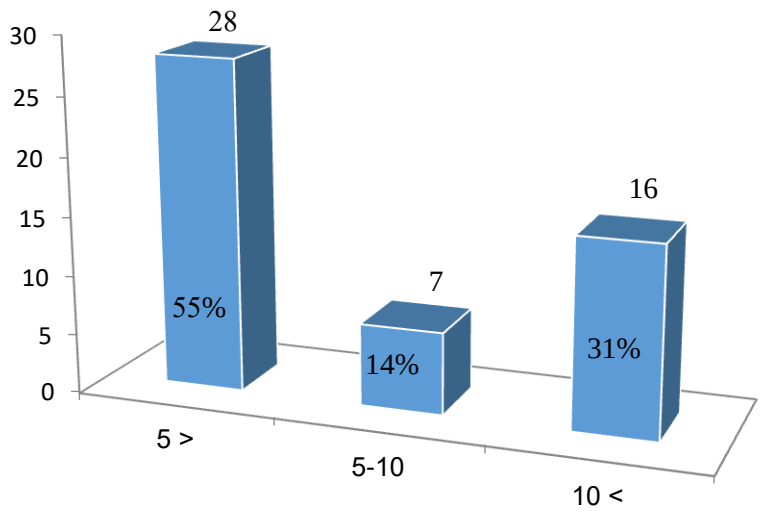

Figure 4. Distribution of HealthCare Providers according to years of Experience

Figure 4 show that, more than half of the participants had less than five years of experience (55%, n = 28). Participants with more than ten years of experience accounted for 31% (n = 16), while those with five to ten years of experience represented the smallest proportion (14%, n = 7). Overall, the sample included both early-career and experienced healthcare providers.

Figure 5 illustrate the distribution of participants according to the number of patients managed by them. It is clear, the majority of participants 62.7% are responsible for 1 to 5 patients. A smaller proportion reported managing 6–10 patients 13.7%, while 11.8% manage more than 10 patients, and another 11.8% reported not managing any patients. This indicates that most participants have moderate exposure to patient care, with only a minority managing very high or no patient load. The data reflect a relatively balanced participation across the different workload categories, providing a diverse representation of experience levels among the sample.

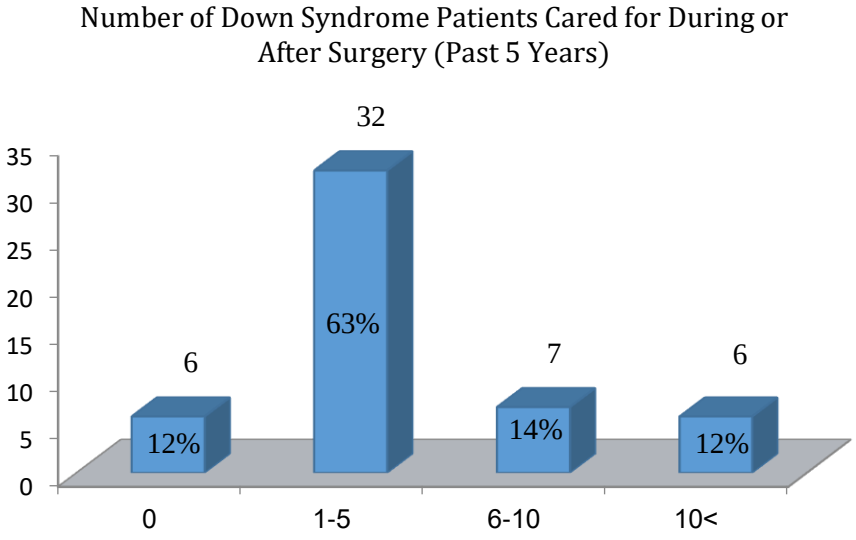

Figure 5. Number of Down Syndrome Patients Cared for During or After Surgery (Past 5 Years)

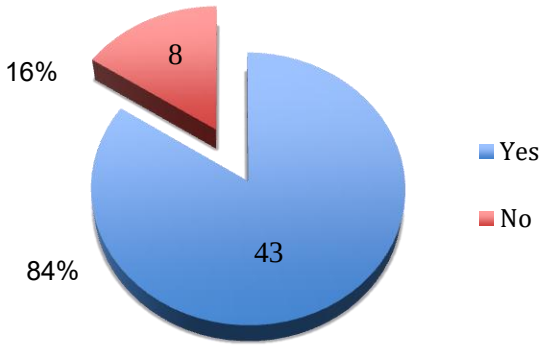

Figure 6. Specialize in Anesthesia

The analysis of participants' specialization in anesthesia display in Figure 6 show that the majority 84% are specialized in anesthesia, while a smaller proportion 16% are not. This indicates that most of the sample consists of professionals with formal training or expertise in anesthesia, which may reflect a high level of knowledge and competence relevant to the study context.

3.2. Section two: Knowledge

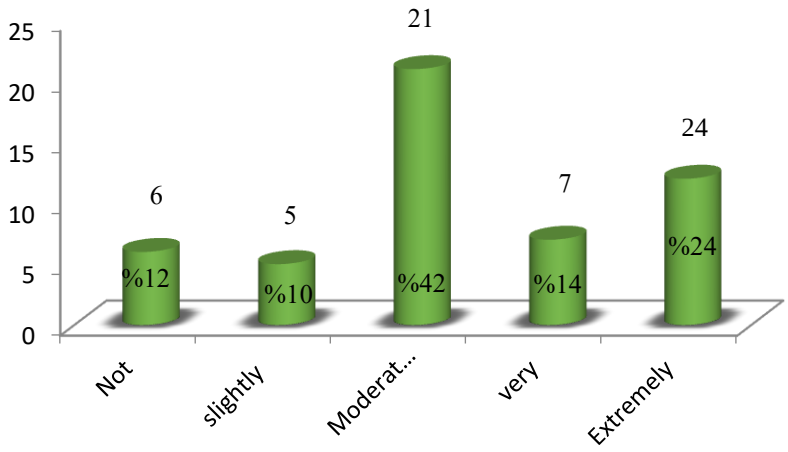

Figure 7. Knowledge Level

Figure 7 it is clear that, the majority of participants 41.2% reported a moderate level of knowledge regarding the anatomical and physiological challenges of anesthesia in Down syndrome patients, followed by those who rated themselves as extremely knowledgeable 23.5%. This suggests an overall acceptable awareness level, with room for further targeted educational interventions.

In Table 1 the analysis of participants' responses regarding major anesthetic concerns for patients with Down syndrome revealed that airway problems were the most frequently reported issue, cited by approximately 64.7% of participants. Cardiac concerns were the second most common, reported by 35.3% of participants, followed by respiratory issues 11.8%, cervical spine/positioning difficulties 5.9%, and other multisystem concerns such as difficult intravenous access, medication dosing, and communication challenges 9.8%. It should be noted that some responses addressed multiple categories simultaneously; therefore, the numbers and percentages may include overlapping counts across different categories. Overall, this distribution highlights the need for heightened awareness and targeted preparation regarding airway management and cardiac monitoring when providing anesthesia to patients with Down syndrome.

Table 1. Major Anesthetic Concerns in Down Syndrome patients

Major Anesthetic Concern Category	Description	Approx. no. of mentions	%
Airway Problems	Difficult airway, airway obstruction, intubation difficulty, large tongue, small mouth, hypotonia, delayed recovery	33	64.7
cardiac concerns	heart defects (septal defects, value issues), cardiac arrest, hemodynamic instability	18	35.3
Respiratory Issues	Breathing problems during anesthesia, postoperative respiratory complications	6	11.8
cervical spine/positioning	cervical spine instability, difficulty positioning	3	5.9
multisystem/ other concerns	multiple malformations, difficult IV access, medication dosing, communication issues	5	9.8

Table 2 illustrates the majority of participants 86.3% reported being aware of the increased risk of bradycardia and hypotension during anesthesia induction in patients with Down syndrome. Only 13.7% of participants indicated a lack of awareness. These results suggest that overall awareness among the surveyed healthcare providers is high, highlighting adequate recognition of cardiovascular risks during anesthetic management in this patient population.

Table 2. Awareness of Bradycardia and Hypotension Risks During Anesthesia induction in patients with Down Syndrome

Response	No. of participants	%
Yes	44	86.3
No	7	13.7
Total	51	100

It is clear from Figure 8 that, less than half of the participants 39.2% reported having received specific training or education related to the anesthetic management of patients with special needs, including those with Down syndrome, while the majority 60.8% indicated that they had not received such training. This finding highlights a notable gap in formal education and suggests the need for targeted training programs to enhance preparedness and safe anesthetic care for this vulnerable patient population.

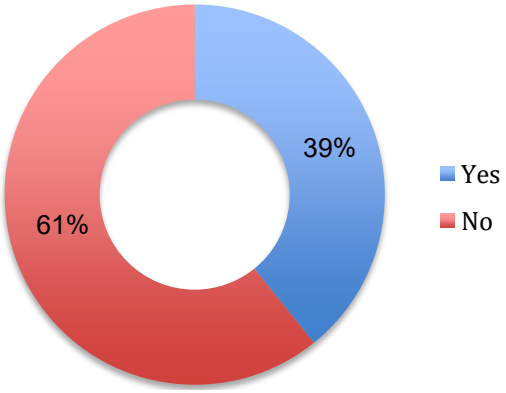

Figure 8. Assessment of Training in Anesthetic Management for patients with special needs

3.3. Section three: Attitude and Perception

An overwhelming majority of participants 94.1% believed that patients with Down syndrome require a different anesthetic protocol compared to the general population, while only a small proportion 5.9% did not share this view. This finding reflects a strong consensus among healthcare

providers regarding the need for tailored anesthetic approaches to address the unique anatomical, physiological, and clinical considerations associated with Down syndrome (Figure 9).

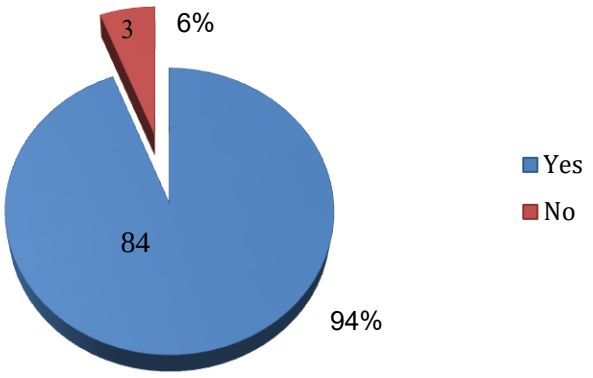

Figure 9. Perception of the Need for a different anesthetic protocol for patients with Down Syndrome

Most participants in Figure 10 reported a **moderate level of confidence** 37.3% in managing a difficult airway in patients with Down syndrome. However, a considerable proportion indicated low confidence levels (levels 1 and 2 combined: 23.5%), while 39.2% reported being **confident** or **very confident** (levels 4 and 5). These findings suggest variability in self-perceived competence and highlight the need for focused training and simulation-based education to enhance airway management skills in this high-risk patient group.

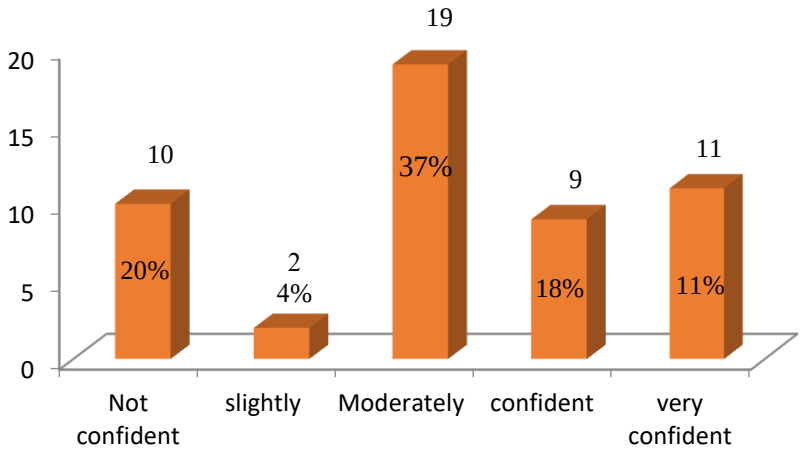

Figure 10. Confidence levels regarding difficult airway management in Down Syndrome patients

The results in Figure 11 indicate a strong consensus among participants regarding the importance of collaboration with parents or family members in perioperative planning for patients with Down syndrome. The vast majority of respondents 96% agreed that family involvement is crucial, while only a small proportion 4% did not share this view. This high level of agreement highlights the perceived essential role of family collaboration in ensuring safe and effective perioperative care for patients with Down syndrome.

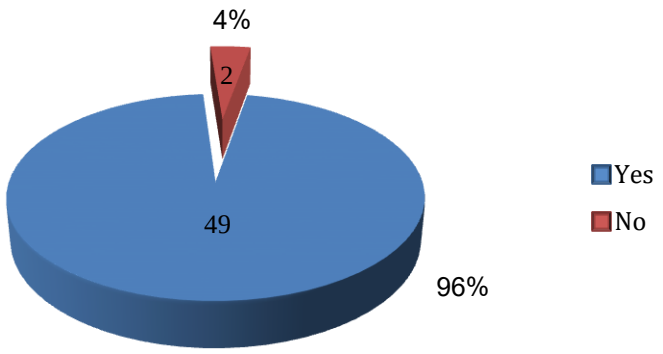

Figure 11. Beliefs regarding the importance of family collaboration in perioperative planning for Down Syndrome patients

Looking to Table 3, the analysis of participants' responses regarding the most significant challenges in providing anesthesia to patients with Down syndrome showed that **airway management** was the most frequently reported concern, mentioned by approximately 60% of respondents. **Cardiac-related issues**, such as heart defects and hemodynamic stability, were reported by 18%, while **communication and cooperation** difficulties with patients or their families were noted by 12%. **Anxiety and patient behavior** were mentioned by 10%, and 8% of participants emphasized the importance of accurate medical history and diagnostic assessment. It should be noted that participants could select more than one challenge, so the total number of responses exceeds the number of participants (n = 51), making it impossible to compute a simple sum of responses. These findings highlight the multifaceted nature of anesthetic challenges in Down syndrome patients, with airway management being the predominant concern alongside cardiac, communicative, and behavioral considerations.

Table 3. Most Significant challenges in providing anesthesia to Down syndrome patients

challenge category	Description	Approx. no. of mentions	%
Airway-related difficulties	airway control & Recovery phase, difficulty of the airway, difficult intubation	30	60
Cardiac-related issues	airway & cardiac anomalies, Cardiac arrest, Heart defects, Hemodynamic stability	9	18
communication/cooperation	Difficulty communicating with parents, communication barriers, cooperation	6	12
anxiety/patient behavior	anxiety during induction, Anxiety	5	10
Other medical/diagnostic considerations	accurate diagnosis, medical history, ECG, Medication sensitivity	4	8

Table 4, show the analysis of participants' responses regarding the most significant barriers to safe anesthetic care for Down syndrome patients revealed multiple overlapping concerns. **Lack of experience and training** was the most frequently mentioned barrier, reported by approximately 35% of mentions. **Equipment-related issues**, including the unavailability of specialized or modern tools, accounted for 24% of mentions. **Cardiac, respiratory, and airway-related** challenges were cited in 20% of responses, while **communication and cooperation difficulties** with patients or their families were noted in 12%. **Issues related to protocols, guidelines, and team coordination** were reported in 10% of mentions, and **patient-related challenges**, such as refusal to cooperate, accounted for 4%. Since participants could indicate more than one barrier, the total number of responses exceeds the number of participants (n = 51), making it impossible to compute a simple sum. These findings highlight the multifactorial nature of barriers in providing safe anesthetic care to Down syndrome

patients, emphasizing the critical roles of experience, adequate equipment, and effective communication.

Table 4. Most significant Barriers to Safe Anesthesia in Down Syndrome Patients

Barrier category	Description	Approx. no. of mentions	%
Lack of experience/training	Lack of training, Limited experience, Lack of specialized practical training	18	35
Lack of specialized/ modern equipment	Lack of specialized equipment, Lack of modern equipment, Limited tools, Advanced qirway tools	12	24
Communication/cooperation	Poor communication, how to explain to family. communication to patient	6	12
Cardiac/respiratory/airway issues	Heartbeat, breathing tube, airway obstruction, cardiac arrest, respiratory problems	10	20
Pratocols/guldline/coofdination	Lack of specific protocaol, Lack of updated guidelines, poor coordination	5	10
Patient-related challenges	patient does not accept the stranger behavioral issues	2	4

The results in Figure12 indicate a strong consensus among participants on the need for additional education and training regarding the anesthetic management of Down syndrome patients. A large majority of respondents 90% affirmed that more training is necessary, while only a small proportion 10% disagreed. This highlights the perceived importance of ongoing professional development to enhance the knowledge and skills of healthcare providers in managing the specific anesthetic needs of Down syndrome patients.

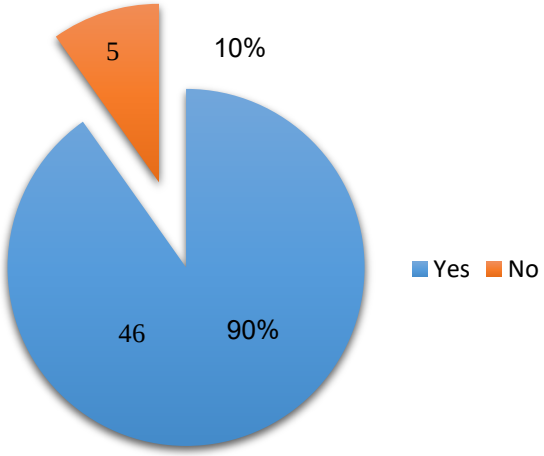

Figure 12. Perceived Need for Additional Education and Training for Healthcare providers in anesthetic management of Down Syndrome patients

From Table 5, the analysis of participants' responses regarding the effectiveness of communication between healthcare providers and family members when preparing for surgical procedures for Down syndrome patients revealed generally positive perceptions. Approximately 20% of responses described communication as **very effective** or extremely important, while the majority around 60% rated it as good or effective in most cases. Another 20% indicated **moderate**, acceptable, or fair communication, sometimes limited by workload or other factors. Many participants also emphasized qualitative aspects, such as enhancing trust, reducing anxiety, providing complete information, and improving family understanding of the procedure. Since participants could provide more than one comment or descriptive evaluation, the total number of responses exceeds the number

of participants (n = 51). These findings suggest that while communication is generally viewed positively, there remains room for improvement to ensure clarity, reduce stress, and enhance family confidence in the perioperative process.

Table 5. Perceived Effectiveness of Communication Between Healthcare providers and family members in surgical preparation for Down syndrome patients

effectiveness category	No. of participants	%
very effective/ very important	10	20
Good/Effective	30	60
moderate/acceptable	10	20
Total	51	100

The results in Table 6 indicate that most participants 77% believe that, the general public is not aware of the specific challenges associated with anesthesia in Down syndrome patients, while only 23% think that the public is aware. This suggests a perceived lack of public knowledge regarding the medical complexities and risks involved in anesthetic care for this patient population, highlighting the potential need for increased public education and awareness initiatives.

Table 6. Perceived Public Awareness of Anesthetic Challenges in Down Syndrome patients

Response	No. of participants	%
Yes	12	23
No	39	77
Total	51	100

4. Discussion

The safe anesthetic management of patients with Down syndrome heavily relies on the provider's awareness of associated anatomical and physiological anomalies. This cross-sectional study provides critical insights into the perspectives of healthcare providers in Benghazi, revealing a complex intersection of high general awareness but prominent gaps in specific training and resources.

Knowledge and Clinical Awareness

The results indicate a strong foundational awareness of specific pathophysiological risks. A significant majority of participants (86.3%) were aware of the heightened risk of bradycardia and hypotension during anesthesia induction. This physiological vulnerability is primarily driven by an exaggerated vagal response, which is frequently compounded by a high prevalence of congenital heart defects, such as atrioventricular septal defects [5,6]. Furthermore, when asked to identify major anesthetic concerns, 64.7% accurately highlighted airway problems, followed by cardiac concerns (35.3%). These findings align closely with global epidemiological data, which consistently identifies anatomical anomalies—such as macroglossia, tonsillar hypertrophy, micrognathia, and subglottic stenosis—as the primary drivers of difficult intubations and perioperative morbidity in this cohort [7,8]. The high theoretical knowledge demonstrated by the Benghazi cohort is commendable and mirrors findings in similar regional studies, where practitioners successfully identify primary physiological risks but report difficulties with practical clinical implementation [9].

The Training and Confidence Gap

Despite the high level of theoretical awareness, our study identified a striking deficit in formal preparation: 60.8% of providers reported having never received specific training in the anesthetic management of patients with special needs. This lack of specialized education directly correlates with the participants' self-reported confidence levels. Only 39.2% felt "confident" or "very confident" in managing a difficult airway in a Down syndrome patient, while the remaining majority reported moderate to low confidence.

This stark contrast between high theoretical knowledge and low clinical self-efficacy highlights a critical "theory-to-practice" gap. Managing a difficult pediatric airway requires not just cognitive recall, but psychomotor skills developed through advanced simulation and specialized pediatric rotations [10,11]. Similar KAP studies in the Middle East and North Africa (MENA) region have consistently reported that while healthcare providers hold positive attitudes toward patients with intellectual disabilities, their clinical confidence is frequently undermined by the absence of structured, hands-on training curriculums [12]. Consequently, the Benghazi practitioners accurately identified a "lack of experience/training" as the most significant barrier to safe care (35%).

Attitudes, Perceptions, and Barriers

The providers demonstrated a highly positive and proactive attitude toward improving care standards. An overwhelming 94.1% recognized the necessity of implementing distinct anesthetic protocols tailored specifically to Down syndrome patients. Additionally, the respondents heavily valued family-centered care, with 96% agreeing that collaboration with parents or family members during perioperative planning is crucial. This aligns perfectly with modern pediatric health supervision guidelines, which strongly advocate for integrating caregivers into the perioperative phase to reduce severe preoperative anxiety and improve patient compliance [13,14].

However, translating these positive, patient-centered attitudes into clinical practice is hindered by systemic barriers. Alongside training deficits, 24% of providers cited the lack of specialized or modern equipment (e.g., advanced airway tools) as a major obstacle. Modern difficult airway management algorithms unequivocally mandate the immediate availability of specialized devices, such as pediatric videolaryngoscopes and appropriately sized supraglottic airways, to prevent hypoxic brain injury during failed intubations [15]. In resource-constrained environments, the absence of these life-saving tools places an immense cognitive and emotional burden on the anesthesiologist [16]. This highlights that individual knowledge and positive attitudes alone cannot guarantee patient safety without adequate institutional infrastructure and financial investment in modern anesthetic technology [17,18].

The study identifies a significant gap: 86.3% of providers recognize cardiovascular risks, yet 60.8% have no specialized training. To bridge this, hospitals must move beyond theoretical awareness. Practical recommendations include mandatory simulation-based training for difficult airway management and the implementation of a 'Down Syndrome Perioperative Checklist' to ensure specialized equipment, cited as a barrier by 24% of staff, is verified before every procedure.

5. Conclusion

Healthcare providers in Benghazi possess a solid foundational knowledge of the cardiovascular and airway risks associated with anesthetizing Down syndrome patients. They also demonstrate highly favorable attitudes toward family involvement and overwhelmingly recognize the necessity for specialized clinical pathways. However, the translation of this awareness into clinical confidence is significantly restricted by a lack of specialized formal training (reported by 60.8% of participants) and critical deficits in modern anesthetic equipment. The findings of this cross-sectional study underscore that while the cognitive readiness of practitioners is high, addressing these specific infrastructural and educational gaps is urgently essential to elevate the standard of perioperative care for this vulnerable patient demographic in Libya.

Recommendations:

- **Implementation of Specialized Training:** Academic institutions and hospital training programs must integrate specific modules and simulation-based workshops focusing on pediatric and special needs anesthesia, particularly advanced airway management.
- **Development of Standardized Guidelines:** Hospitals should establish and implement clear, localized clinical protocols for the preoperative assessment (especially cervical spine and cardiac screening) and intraoperative management of Down syndrome patients.
- **Resource Allocation:** Hospital administrations must prioritize the procurement of modern, specialized airway equipment (e.g., pediatric video laryngoscopes, various sizes of laryngeal mask airways) to mitigate equipment-related barriers.

- **Public and Family Education:** Given that 77% of providers perceive public awareness to be low, community outreach initiatives should be developed to educate families of DS patients about surgical risks and the importance of thorough preoperative histories.

Limitations:

- **Small Sample Size:** The sample size of 51 healthcare providers, while representative of the specific setting, is relatively small, which may limit the generalizability of the findings to other regions in Libya.
- **Self-Reporting Bias:** The study is subject to self-reporting bias, where participants may overestimate their knowledge. Additionally, because the study was confined to Benghazi Medical Center, the findings may not fully represent the infrastructure and training levels in other Libyan cities or the private sector

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Author Contributions

HA conceived the idea and designed the study. HA and MH collected the data. MH and AE analysed and interpreted the data. HA and DA wrote the first draft of the manuscript. HA, SM and DA reviewed the manuscript draft. The author read and approved the final manuscript.

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Competing Interests

The authors declare that there is no competing interests.

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وجهات نظر مقدمي الرعاية الصحية حول التخدير في متلازمة داون: دراسة مقطعية في بنغازي، ليبيا

الملخص

الخلفية :يمثل المرضى المصابون بمتلازمة داون تحديات تشريحية وفسيولوجية فريدة تتطلب إدارة تخدير متخصصة. هدفت هذه الدراسة إلى تقييم مستوى المعرفة، والمواقف، والتصورات لدى مقدمي الرعاية الصحية بشأن تخدير مرضى متلازمة داون في مدينة بنغازي، ليبيا.**الطرق :**أُجريت دراسة مقطعية وصفية في الفترة من يناير إلى ديسمبر 2025 في مركز بنغازي الطبي ومراكز إعادة التأهيل المحلية .تم استخدام استبيان معتمد مسبقاً مكون من ثلاثة أقسام لتقييم البيانات الديموغرافية، والمعرفة، والمواقف، والمخاوف .**النتائج :**شملت الدراسة 51 من مقدمي الرعاية الصحية، شكل أطباء التخدير الغالبية منهم بنسبة (63 .(% في حين كان 86.3% من المشاركين على دراية بالمخاطر المتزايدة لبطء ضربات القلب وانخفاض ضغط الدم أثناء تحريض التخدير ، أفاد 60.8% بعدم تلقيهم أي تدريب محدد للتعامل مع المرضى ذوي الاحتياجات الخاصة .واعتُبرت إدارة مجرى الهواء التحدي السريري الأبرز بنسبة (60 .(%وافقت الغالبية العظمى (94.1%) على أن مرضى متلازمة داون يحتاجون إلى بروتوكولات تخدير مخصصة ، وأعرب 90% عن حاجة ماسة لمزيد من التدريب .تم تحديد العوائق الرئيسية أمام الرعاية الآمنة في نقص الخبرة/التدريب (35%) ونقص المعدات المتخصصة (24 .(%**الاستنتاج :**يُظهر مقدمو الرعاية الصحية في بنغازي وعياً أساسياً كافياً وموقفاً إيجابياً تجاه الرعاية المتخصصة لمرضى متلازمة داون. ومع ذلك، توجد فجوات كبيرة في التدريب الرسمي وتوفر المعدات المتخصصة، مما يبرز الحاجة الملحة لبرامج تعليمية موجهة وبروتوكولات مؤسسية.

الكلمات المفتاحية: تخدير، متلازمة داون، المعرفة، السلوك، مقدموا الرعاية الصحية