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Using the Advanced Dental Admission Test (ADAT) for Admission Purposes

Using the Advanced Dental Admission Test (ADAT) for Admission Purposes: A Guide for Advanced Dental Education Programs

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Overview

The American Dental Association's (ADA) Advanced Dental Admission Test (ADAT) is designed to provide dental education programs with an additional means to assess program applicants' potential for success in advanced dental education.

The ADA's Department of Testing Services (DTS) implements the ADAT program under the auspices of the ADA's Council on Dental Education and Licensure (CDEL). The ADAT is administered at test centers operated by Pearson VUE.

The ADAT is composed of multiple-choice questions presented in English, and is developed according to established test specifications. The ADAT consists of three test sections covering the following areas: Biomedical Sciences; Clinical Sciences; and Data, Research Interpretation, & Evidence Based Dentistry.

This guide is intended to provide advanced dental education programs with information concerning the appropriate use and interpretation of ADAT results. Information is provided in the following areas:

- Utilization of ADAT Results in Admission Decisions
- History of the ADAT
- Evidence Supporting Use of the ADAT
- ADAT Content and Scales
- Administration of the ADAT
- ADAT Results Reporting and Interpretation
- Additional Guidelines for Interpreting and Applying ADAT Results

Additional information concerning the ADAT program is available online at ADA.org/adat. The ADAT website contains a wealth of information about the ADAT, including:
- the ADAT Candidate Guide, which provides further details concerning administration of the ADAT Program
- practice test questions that candidates can use to familiarize themselves with the types of questions that appear on the ADAT
- a white paper providing an overview of ADAT policies and procedures supporting and promoting fairness; this document outlines the many efforts undertaken by CDEL and DTS to help ensure the ADAT provides a fair and unbiased assessment of candidate skills

Utilization of ADAT Results in Admission Decisions

Use of the ADAT should take place within the context of advanced dental education programs' standard admission procedures. Each program differs in how admission decisions are made, and the specific tools available to support those decisions. The following provides general considerations for using ADAT results in admission decisions.

- Each program must make its own decision concerning how to use ADAT results.
- In making decisions as to how to use admission tools, including ADAT results, programs should carefully consider the following:
    - Program and school requirements
    - The knowledge, skills, abilities, and other characteristics (KSAOs) necessary to succeed in the program. This should also include characteristics and behaviors that can derail students and lead to failure (e.g., poor study habits).
    - Information available to support admission decisions (i.e., admission tools).
    - The strengths and weaknesses of each admission tool, including:
        - information the tool provides relative to program requirements and the identified KSAOs
        - quality and accuracy of the information provided
        - evidence that supports the use of the tool
        - the extent to which information provided by the tool might be affected by factors unrelated to the KSAOs of focal interest
        - the extent to which the tool provides a fair and unbiased evaluation of candidate qualifications
        - legal defensibility of using the tool
        - the extent to which the tool permits the program to meaningfully compare the program relevant skills of candidates with different backgrounds (educational training, etc.)
    - The strengths and weaknesses of the set of admission tools utilized, including:
        - how information from different admission tools is weighted in decision making
        - how redundancy in the information provided by different tools is handled (e.g., via weighting)
        - any deficiencies that might be present (e.g., helpful or necessary information that may be lacking from the set of tools)
- Programs might differ in how they choose to use the ADAT.
    - Some programs may, in recognition of current challenges in comparing applicants across dental programs, choose to supplement the information from existing admission tools with ADAT results in making candidate admission decisions.
    - Programs may weight ADAT results in accordance with results from a local (i.e., program-specific) validation study, or in accordance with other information available to the program concerning the relationship between ADAT scores and program performance.
    - Some programs may choose to use ADAT results only in certain prescribed situations:
        - Situations where little additional information is available concerning candidate qualifications (e.g., no candidate information is available concerning GPA, class rank, or results from other standardized tests).
        - Situations where candidates are equally qualified, and there is a need to break a tie.
    - Some programs may simply collect data on ADAT performance without using it to inform individual admission decisions. Programs can then review the information, become comfortable with the insight provided, and then decide how best to use ADAT results in future years.

- Programs should not rely exclusively on ADAT results in making admission decisions. The ADAT should be used in conjunction with other admission tools that provide insight into candidate qualifications as they relate to core program requirements.
- Programs should decide on their approach, and then apply that approach consistently, in compliance with school and legal requirements.

History of the ADAT

Background

The ADA's decision to pursue development of advanced dental admission test was based on the conveyed needs of communities of interest. Some of those needs were stated in published articles (Fagin, Howell, Da Silva, & Park, 2014; Fagin, Howell, & Park, 2015), while others were expressed directly to the ADA.

Many advanced dental education programs communicated they were left in a difficult position when the Joint Commission on National Dental Examinations (JCNDE) transitioned to pass/fail reporting in 2012. The JCNDE had made this decision for a variety of reasons, one of which was that the NBDE had never been validated for admission purposes, and thus its use within that context was questionable and posed a potential threat to NBDE test security. In the absence of NBDE scores, advanced dental education programs had little information available to compare the qualifications of candidates with differing educational backgrounds and experiences. The situation was exacerbated by the movement toward pass/fail grading at some dental schools. For programs caught in this precarious situation, ADAT results can provide valuable insight into candidate skills to inform decision making.

Content Development

The areas to be measured within the ADAT were preliminarily identified through review and analysis of the findings of an Advanced Dental Admission Test Task Force Report submitted to the ADA House of Delegates in September 2010. This report included findings from a survey on the evaluation and selection of applicants for positions in advanced dental education programs. This survey was conducted as part of the ADEA Future of Advanced Dental Education Admissions (ADEA/FADEA) project. In May 2014, ADA's Council on Dental Education and Licensure (CDEL) endorsed a creation of a business plan to develop the ADAT. The following October, CDEL distributed a survey to directors of advanced education programs to assess the demand for the ADAT; the survey results were very positive. Thus, in November 2014, CDEL recommended that the ADA pursue the development of the ADAT. The final plan of development was approved by the ADA Board of Trustees in December 2014.

The ADAT test specifications concerning the Biomedical Sciences and Clinical Sciences test sections are based on the test specifications for the National Board Dental Examinations (NBDE) Parts I and II. As such, the ADAT relies on the content domain foundation established for these two examination programs (e.g., the practice analysis involving entry-level general dentists conducted for the NBDE Part II). ADAT content within the Biomedical and Clinical Sciences sections is proportionally reduced, relative to the NBDE specifications. ADAT test specifications for the Data, Research Interpretation, & Evidence Based Dentistry section were constructed based on Test Construction Team (TCT) member input and guidance from the ADA Science Division and its Center for Evidence-Based Dentistry.

The test specifications for the ADAT are reviewed and approved by the CDEL annually, via its Dental Admission Testing Committee (DATC).

The ADA reached out to its members seeking volunteers to help construct the ADAT in December 2014; the first TCT meetings for each section of the ADAT were convened in May 2015. TCTs relied on existing DTS Item Writing Guidelines, and also incorporated a new method of presenting patient information: the Patient Box. A 100-item practice test was also created to help familiarize examinees with the types of questions that could be asked on the ADAT.

<u>Adjustments after the 2016 administration</u>

The ADAT Program instituted several changes to the ADAT based on findings obtained in 2016. Most notably, the Principles of Ethics & Patient Management (PEPM) section was not performing at desired psychometric levels, and from a content perspective did not appear to be truly meeting the needs of advanced dental education programs. Thus, several changes were made to the exam structure and test specifications. First, the PEPM scale was eliminated as a separate reportable scale. PEPM items still appear on the exam, but are now incorporated into the Clinical Sciences (CLI) section. Second, due to the elimination of the PEPM scale, the number of items in the CLI section and Data, Research and Interpretation, and Evidence Based Dentistry (DRI) section was increased. Twenty (20) of the thirty (30) items in the 2016 PEPM scale were incorporated into the CLI scale, while the remaining ten (10) items were made available for use in the DRI scale.

For more information about the ADAT adjustment after the 2016 administration, please refer to the 2017 edition of the present document (i.e., "Using the Advanced Dental Admission Test (ADAT) for Admission Purposes: A Guide for Advanced Dental Education Programs 2017"), which is available on the ADAT website (www.ada.org/adat).

Evidence Supporting Use of the ADAT

The following evidence supports use of the ADAT. Programs should carefully consider this information, as well as information and evidence supporting other available admission tools, in determining how best to approach use of the ADAT for admission purposes.

- ADAT test development, administration, and scoring are implemented by the ADA's Department of Testing Services (DTS), which employs professionally trained staff that includes individuals with advanced degrees in Psychometrics, Educational Psychology, Industrial/Organizational psychology, and Leadership.
- DTS has implemented dental high stakes testing programs for decades, including the testing programs of the Joint Commission on National Dental Examinations.
- Due to their high stakes nature, the testing programs under the care of DTS have been subjected to, and withstood, intense scrutiny over time. All US dental boards currently accept the National Board Dental Examinations (NBDE) and the National Board Dental Hygiene Examination (NBDHE) as valid evidence that a candidate possesses the cognitive skills necessary to safely practice dentistry and dental hygiene respectively.
- Use of the ADAT is supported based on content validity evidence. ADAT items were written by dental subject matter experts, and other subject matter experts whose qualifications matched the needs dictated by the test specifications.
- All ADAT TCT member qualifications are reviewed by CDEL.
- Many ADAT TCT members also write items for other high stakes examination programs (e.g., for the National Board Dental Examinations).
- DTS has in place robust policies and procedures that are designed to support and promote fairness in the ADAT Program. A detailed description of these policies and procedures is available at www.ada.org/adat in the report entitled *The DAT and ADAT Programs: Overview of Policies and Procedures Supporting and Promoting Fairness*.
- ADAT TCT members receive extensive training on how to develop valid and reliable questions. This includes training on fairness, and sensitivity considerations in item writing.
- ADAT administrations occur under standardized testing conditions that are closely monitored. Deviations from standardized testing conditions are reported to the ADA's Department of Testing Services by the test administration vendor (Pearson VUE). Candidates who violate rules and regulations can incur severe penalties which include the voiding of scores and the imposition of mandatory wait periods.
- Candidate performance data collected on the ADAT shows that the ADAT reliably distinguishes between candidates of varying skill levels.

The following sections provide additional information concerning ADAT content, administration, scoring, and reporting.

ADAT Content and Scales

ADAT candidates receive the following scale scores:

- ADAT Overall (ADAT) (Critical Thinking in Dentistry)
- Biomedical Sciences (BIO)
- Clinical Sciences (CLI)
- Data, Research Interpretation, & Evidence Based Dentistry (DRI)

ADAT Overall Scale (Critical Thinking in Dentistry)

The ADAT overall scale is a composite scale providing an indication of how the candidate performed on all of the content areas presented in the ADAT. The ADAT overall score is a weighted average of the scale scores from all three ADAT disciplines. Descriptions of each of those content areas appear below.

Biomedical Sciences

This ADAT section focuses on cognitive skills involving the following subject areas:

BIOMEDICAL SCIENCES (80 Items)
Anatomic Sciences (20 items)
Gross Anatomy
Histology
Oral Histology
Developmental Biology
Biochemistry and Physiology (20 items)
Biological Compounds
Metabolism
Molecular and Cellular Biology
Connective Tissue
Membranes
Nervous System
Muscle
Circulation
Respiration
Renal
Oral Physiology
Digestion
Endocrines
Microbiology and Pathology (20 items)

General Microbiology
Reactions of Tissue to Injury
Immunology and Immunopathology
Microbiology, Immunology, and Pathology of Specific Infectious Diseases
Systemic Pathology
Growth Disturbances
Dental Anatomy and Occlusion (20 items)
Tooth Morphology
Pulp Cavity Morphology
Calcification and Eruption
Principles of Occlusion and Function
Clinical Considerations – Tooth Morphology and Anomalies

Clinical Sciences

This section of the ADAT focuses on cognitive skills involving the following disciplines:

CLINICAL SCIENCES (80 standalone and case-based items)
Endodontics
Operative Dentistry
Oral and Maxillofacial Surgery and Pain Control
Oral Diagnosis
Orthodontics and Pediatric Dentistry
Periodontics
Pharmacology
Prosthodontics
Principles of Ethics
Patient Management

With respect to Principles of Ethics, it should be noted that these questions do NOT directly measure professional ethics, or indicate whether a person will behave ethically. Rather, these questions provide information concerning whether a candidate can, for example, recognize the ethical principles that apply to particular situations, and how those situations could be handled in accordance with those ethical principles.

Data, Research Interpretation, & Evidence Based Dentistry

This section of the ADAT focuses on concepts taught within the framework of Evidence Based Dentistry. Within this framework, clinicians must know how to critically and systematically review research findings, understand basic methodological issues, and use this information to apply research findings in decision making involving their practice and patients. Thus, the focus of this scale rests entirely on methodology,

interpretation, and application of research, as opposed to referencing specific findings (e.g., the effectiveness of fluoride in preventing caries) that emerged from this research base. Specific findings would instead be referenced in the Biomedical and Clinical Sciences sections of the ADAT.

The following are core concepts in Evidence-Based Dentistry:
- Asking precise, structured clinical questions
- Finding the best evidence using currently available electronic resources
- Reading and critically evaluating research information
- Understanding clinical trial design, such as therapy, diagnosis, and qualitative assessment
- Understanding and interpreting basic statistical information, such as descriptive statistics, odds ratios, risk reduction, and relative risk, to implement Evidence Based Dentistry appropriately in practice settings
- Using evidence based clinical guidelines, recommendations, and systematic reviews
- Implementing best evidence in clinical practice.

This section of the ADAT focuses on cognitive skills involving the following subject areas:

DATA, RESEARCH INTERPRETATION, & EVIDENCE BASED DENTISTRY (40 items)
Study Design
Data Analysis
Result Interpretation
Inference and Implication

Administration of the ADAT

Policies and procedures for administering the ADAT are presented in the ADAT Examination Guide, which is published on an annual basis. This guide is available on the ADAT website (www.ada.org/adat).

ADAT Eligibility

Eligibility to take the ADAT is based on the candidates' training and their current status as a student or graduate.

Training	Enrollment Status	Action Required
CODA Accredited Dental School	Current Student	School is responsible for approving the candidate's eligibility.
	Graduate	Candidate must send proof of graduation to DTS. Eligibility is approved after receipt of reasonable proof.
Non-Accredited Dental School	Current Student	Candidate requests an Educational Credential Evaluators (ECE) electronic report to certify status as a current dental student.
	Graduate	Candidate requests an ECE electronic report to confirm dental degree.

ADAT Administration Vendor and Testing Schedule

The ADAT is administered at Pearson VUE test centers in the United States, its territories (including Guam, Puerto Rico, and the Virgin Islands), and in Canada. Administration occurs during a predefined testing window indicated in the ADAT Examination Guide.

The time permitted for each ADAT section and for scheduled breaks is shown in the table below.

ADAT TESTING SCHEDULE	
Tutorial	15 minutes
Biomedical Sciences (80 items)	**95 minutes**
Break (optional)	10 minutes
Clinical Sciences (80 items)	**90 minutes**
Break (optional)	10 minutes
Data, Research Interpretation, and Evidence-Based Dentistry (40 items)	**45 minutes**
Post Test Survey (optional)	5 minutes
Total Time	**4 hours 30 minutes**

Candidates are prompted to review their answers in each section before taking a break or moving on to the next section when time permits. Once a candidate has begun a break, he or she is not allowed to return to the previous sections to view questions and/or change answers. Partial testing is not permitted; applicants are required to take all three sections of the ADAT.

In taking the ADAT, candidates agree to adhere to examination rules and regulations, which are described in the ADAT Examination Guide available at www.ada.org/adat. Candidate behavior is closely monitored during test administration to confirm that rules and regulations are followed. Candidates who violate examination regulations are subject to severe penalties that include the voiding of scores and the imposition of mandatory wait periods.

ADAT Results Reporting and Interpretation

Official ADAT Results

Official ADAT results are reported electronically within three to four weeks after the candidate has taken the examination. Test results are posted to the candidate's My Account page, and sent to the advanced dental education programs selected on the candidate's ADAT application or indicated in additional score report requests.

Official results are reported as ADAT scale scores. To assist with interpretation, the Score and Audit Information page at www.ada.org/adat is updated annually with a final report indicating scale scores and corresponding percentiles with respect to the overall candidate pool after the yearly test window has closed.

Candidate percentiles are not provided in the DTS Hub and My Account. This is due to the interpretational challenges associated with percentiles (i.e., their dependence on the sample tested, and their inability to provide a fixed skill interpretation). In lieu of this candidate-specific information, the ADAT Program provides overall normative tables that can serve as a reference in understanding the skills of those who tested in a given year, and how candidates compare to each other (Appendices B1 and B2).

Results are provided electronically to all programs selected by the candidate. Many advanced dental education programs participate in the ADEA Postdoctoral Application Support Service (ADEA PASS) and benefit from the corresponding services provided. If a candidate requests their results be sent to any advanced dental education program, their results will also be made available to the ADEA PASS for use within this service. It should be noted that ADEA PASS is separate and distinct from the American Dental Association's Department of Testing Services, and therefore operates independent of the ADAT Program. For information concerning ADEA PASS test reporting policies, please contact the ADEA PASS directly (http://www.adea.org).

When ADAT results are reported, the candidate's full testing history is reported (i.e., test results for all testing attempts are listed). Once a candidate has taken any part of the ADAT, they cannot request the scores to be voided. In considering a candidate's performance across multiple testing attempts, the Department of Testing Services recommends that programs consider results from the most recent administration, as these should provide the best insight into the candidate's current skills.

ADAT Scale Scores

Official ADAT scores are calculated based on a candidate's correct responses to items. ADAT results are reported in terms of scale scores. These scale scores are not raw scores (i.e., the number of correct answers). The conversion of raw scores to scale scores is accomplished using Item Response Theory procedures. Scale scores enable meaningful comparison of the performance of candidates who have tested using different test forms and at different times. The ADAT program does not designate passing or failing scores.

ADAT scale scores range from 200 to 800. Higher scale scores in a specific area indicate higher cognitive skills in that area. Any test section not taken is designated a score of 200. ADAT scale scores are presented in the following areas:
- Overall ADAT (Critical Thinking in Dentistry)
- Biomedical Sciences
- Clinical Sciences
- Data, Research Interpretation, and Evidence-Based Dentistry

Scoring Model and Equating Procedures

Scale scores for the four ADAT disciplines are calculated using Item Response Theory (IRT) and the Three-Parameter Logistic model (3-PL Model, Birnbaum 1968). In providing an estimate of candidate skills, the IRT 3-PL Model takes into account the following:
- The difficulty level of each test item
- The quality of each test item (item discrimination)
- The impact of guessing on item performance

The ADAT does not penalize candidates for guessing. However, the scores are statistically adjusted based on the items' susceptibility to guessing. This practice increases the precision and accuracy of skill estimation.

Each administered ADAT includes items that enable the Department of Testing Services to place different forms of the test on a common measurement scale, thereby adjusting the forms for differences in difficulty level. Because of this adjustment, ADAT scores have the same meaning regardless of the test form that was administered.

Although the ADAT consists of 200 questions in total, some items do not contribute to examinee scores. After the data is collected, these questions are evaluated for their statistical performance. If deemed

appropriate, the items may be used on future test forms to refresh content. Candidates are not able to distinguish between questions which contribute to their score and those that do not.

Composite and Discipline Based Scales

The ADAT Overall scale is referred to as a composite scale because it is calculated using scores from other scales (i.e., the discipline based scales). The ADAT Overall score is a weighted average of scale scores from the Biomedical Sciences, Clinical Sciences, and Data, Research Interpretation, & Evidence Based Dentistry scales. Weights are proportional to the number of items in each area, and the final score is rounded to the nearest ten.

During the ADAT's first year of implementation, the ADA's Department of Testing Services established the discipline based ADAT score scales so they each had a mean of 500 and a standard deviation of 100. These scale properties (i.e., mean of 500 and standard deviation of 100) are challenging to maintain over time, due to the fact that the population taking the ADAT can change substantially over the years of implementation. In short, as more and more advanced dental education programs use the ADAT, the level of skills of the overall candidate pool may shift based on the skills of those included. Programs should anticipate that recalibration of the score scale may be necessary in future years, as the population taking the ADAT changes.[1]

Interpretation of composite scale scores is slightly different from interpretation of discipline based scale scores. It is important to note that scores on the ADAT Overall scale have a narrower range than scores on the three discipline scales. While higher scores (e.g., 750 to 800) are possible on the ADAT Overall scale, such scores are more difficult to achieve, and were in fact not observed in the 2022 sample.

A complete listing of the percentiles associated with ADAT scale scores from 2022 appears in Appendix B1.

Additional Guidelines for Interpreting and Applying ADAT Results

Similar to 2021, in 2022 official ADAT results were released to candidates and programs three to four weeks after the candidate took the examination.

The following guidelines may be helpful for interpreting and applying ADAT results:
- Candidates may choose to take the examination more than once. It is recommended that programs reference the candidate's most recent results to best represent the candidate's skills.
- It is recommended that programs avoid employing cut scores with the ADAT (i.e., admitting candidates with ADAT scores of "x" or above) until they have a reasonable understanding of the cognitive dental skills associated with the various ADAT score levels, and how this relates to the skills required at entry into the program.
- Until the preceding information is available to a program, it is recommended that ADAT results be interpreted on a relative basis, as follows:
  - Candidates with higher scores on each scale have demonstrated stronger cognitive skills than candidates obtaining lower scores.
- Candidates with lower percentile standing on the ADAT may still be viable candidates for advanced dental education programs. If, for example, ADAT examinees are more highly skilled on average than those who do not take the ADAT, then their percentile standing within the general dental population may be considerably higher than one might think given their achieved ADAT percentile standing. Programs should also consider that—within the total pool of advanced dental education candidates—the skills of those who choose to challenge the ADAT in a given year may

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[1] Recalibration re-centers the score scale and adjusts the score distribution so it takes on desirable properties. The examination's validity and reliability remains intact.

differ from those who do not. In short, candidates with lower ADAT percentile standing should not be broadly interpreted as "poor candidates."

- When utilizing the percentile tables in Appendices B1 and B2, programs should be mindful of the fact that strictly speaking percentiles obtained across test administration periods (i.e., across norm groups) are NOT directly comparable with regard to the level of skills represented at each percentile level. Comparison of relative performance using percentiles within testing periods (within a given norm group) is useful and appropriate. DTS provides percentiles for 2022 and also the latest five years (2018-2022) combined in case programs want to make the comparisons across a broader sample of administrations of the ADAT.

- Candidates' percentile standing can and will change across test administration periods, even though a given candidate's performance on the examination remains the same. This is also why ADAT official results are provided in scale scores, which do not change and have the potential to take on fixed interpretations (i.e., a score of 'x' signifies a specific level of cognitive skills with respect to a particular content area of interest).

- When examining and comparing candidate performance, programs should use caution when interpreting differences in percentile standing. Differences in percentile standing communicate differences in candidate relative standing in the population tested, NOT the amount of difference between candidates in their underlying skills. For example, assuming the data are normally distributed, a five percent (5%) difference in percentile standing could correspond to:
    - A small difference in skills for candidates who fall in the middle of the distribution (e.g., 50th percentile).
    - A large difference in skills for candidates scoring in the tails of a distribution (e.g., 95th percentile).

- Use percentiles to understand candidates' relative standing within the population tested.

- Use scale scores to understand candidate skill levels, as well as differences between candidates in their underlying skills.

- Comparison of candidates who tested in different years is best made through comparisons of scale scores and percentiles (Appendices B1 and B2), which is made available annually in September.

- DTS recommends that programs focus their attention on the ADAT Overall scale. This scale contains larger numbers of items and is therefore more reliable than scales containing fewer items (e.g., Data, Research Interpretation, & Evidence Based Dentistry).

- Do NOT overemphasize small differences in test scores.

- Do NOT simply rank order candidates and make selection decisions based on a top-down approach. This approach may disadvantage certain applicant groups.

- As a reminder, in making admission decisions, programs should carefully consider a) the full set of KSAOs required for success in a program, in relation to program, school, and legal requirements, and b) the qualifications of candidates.

- Programs should let the above perspective help inform their decisions with respect to individual candidates.

DAT Score Reliability

Reliability coefficient estimates for 2022 ADAT scale scores are given in the table below[2]. Reliability coefficients can range from zero to one, with higher values indicating higher reliability.

Reliability coefficients for ADAT scale scores: 2022 (612 administrations)

ADAT Scale	Reliability
ADAT Overall (ADAT)	.92
Biomedical Sciences (BIO)	.82
Clinical Sciences (CLI)	.73
Data, Research Interpretation, & Evidence Based Dentistry (DRI)	.77

The Department of Testing Services recommends that candidates and programs focus their attention on the ADAT Overall scale. This scale is based on more items and is therefore more reliable than scales containing fewer items.

Normative Information

ADAT Scale Scores. Descriptive statistics for 2022 ADAT scale scores are provided in the table below. ADAT scale scores can range from 200 to 800.

Descriptive statistics for ADAT scale scores: 2022 (612 administrations)

Scale Type	Scale	Mean	SD	Min	Max
Composite	ADAT Overall (ADAT)	492.1	78.4	250	720
Discipline	Biomedical Sciences (BIO)	498.3	97.2	220	800
	Clinical Sciences (CLI)	486.7	78.5	200	720
	Data, Research Interpretation, & Evidence Based Dentistry (DRI)	489.8	97.6	200	800

Frequency distributions for the four ADAT scales from 2022 are presented in Appendix A1. The horizontal axis of the figure shows the range of possible ADAT scale scores (200 to 800), the left vertical axis shows the number of times each scale score was observed, and the right vertical axis shows the cumulative percentile associated with each scale score (superimposed in black line on the graph). Frequency distributions for the four scales for the 2018 through 2022 calendar years are presented in Appendix A2. The graphs are interpreted the same as the current year graph, but a larger sample size is used.

2022 ADAT Percentiles. Appendix B1 presents the percentiles associated with scores on each ADAT scale, based on the 612 ADAT administrations in 2022. For each scale and scale score in Appendix B1, the corresponding scale score percentile can be interpreted as the percentage of ADAT 2022 candidates who achieved that scale score or lower. If a given scale score corresponds to a percentile of 88, for example, then 88% of ADAT 2022 candidates achieved that scale score or lower.

2018-2022 ADAT Percentiles. Appendix B2 presents the percentiles associated with scores on each ADAT scale, based on 1,901 ADAT administrations occurring from 2018 through 2022. These percentiles are interpreted in a similar manner to the 2022 percentiles, except they rely on a broader normative group.

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[2] The reliability coefficients are calculated from Item Response Theory (IRT) 3-Parameter Logistic (3PL) model estimates of candidate skill levels and their standard errors using the methods described by Sireci, Thissen and Wainer (1991) and Childs et al. (2004).

Normative Information, by Dental Specialty. At the time of application to complete the ADAT, candidates indicate the programs to which they would like to send their results. Based on the programs selected, candidates can be classified into one or more specialty groups. Candidates who select programs from multiple dental specialties are classified into all the specialties they selected. In 2022, 37% of candidates selected just one specialty program.

Appendix C1 contains descriptive statistics for 2022 ADAT scale scores, by dental specialty. Appendix C2 contains descriptive statistics for 2018 through 2022 ADAT scale scores (combined), by dental specialty. Dental specialty areas are shown if they were selected by 25 or more candidates.

Appendix D1 contains frequency distributions for the 2022 ADAT Overall scale, by dental specialty, for those specialties selected by 80 or more candidates. Appendix D2 contains frequency distributions for the ADAT Overall scale for the 2018 through 2022 sample, by specialty, for those specialties selected by 80 or more candidates. The horizontal axis of the figures shows the range of possible ADAT scale scores (200 to 800), the left vertical axis shows the number of times each scale score was observed for candidates choosing the specialty, the right vertical axis shows the cumulative percentile for each scale score (superimposed in black line on the graph).

As the ADAT program grows and additional candidates complete the examination, more normative breakdown groups are likely to satisfy the criteria indicated above (N≥25 for descriptive statistics, N≥80 for frequency distributions), and will thus be able to be presented in future years.

Concluding Comments

The American Dental Association is pleased to provide the Advanced Dental Admission Test for consideration by advanced dental education programs and communities of interest. For additional information concerning this examination program, please visit the ADAT website (www.ada.org/adat).

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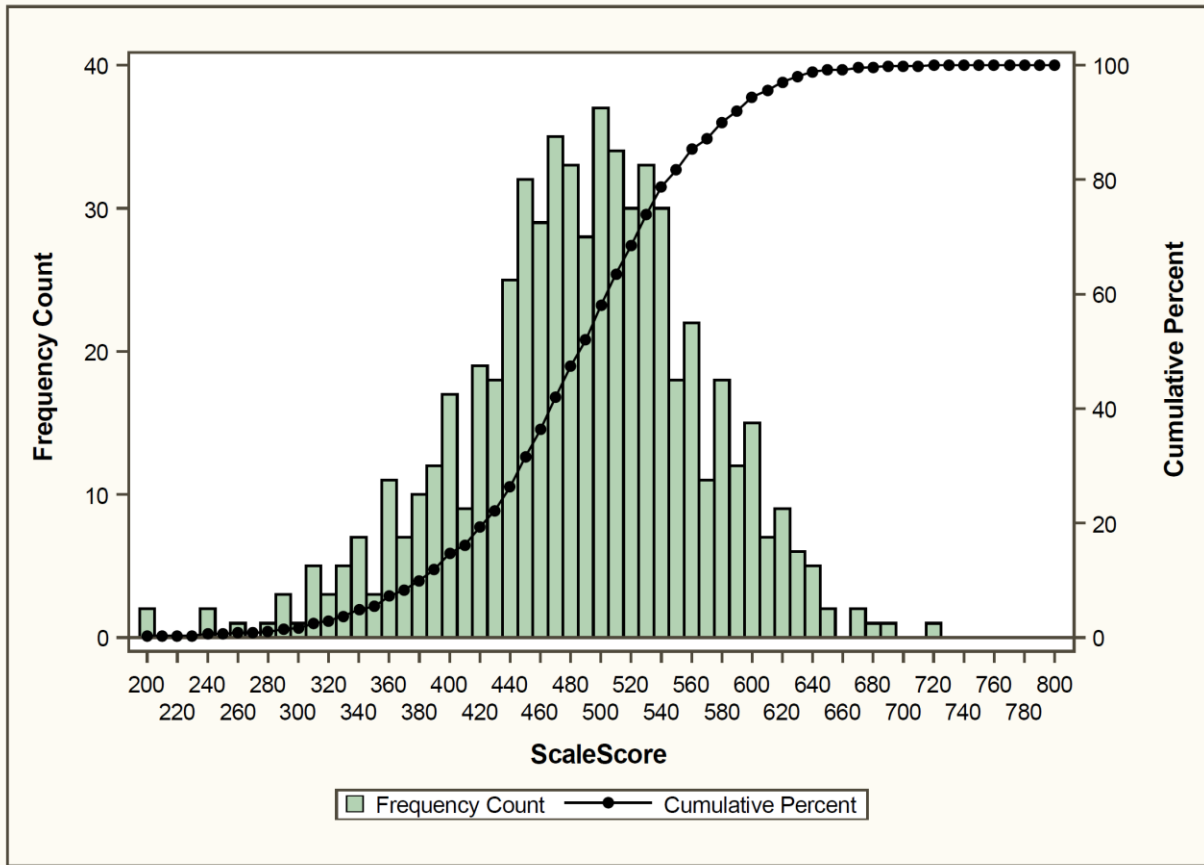**Appendix A1: Frequency Distributions for ADAT Scale Scores: 2022**

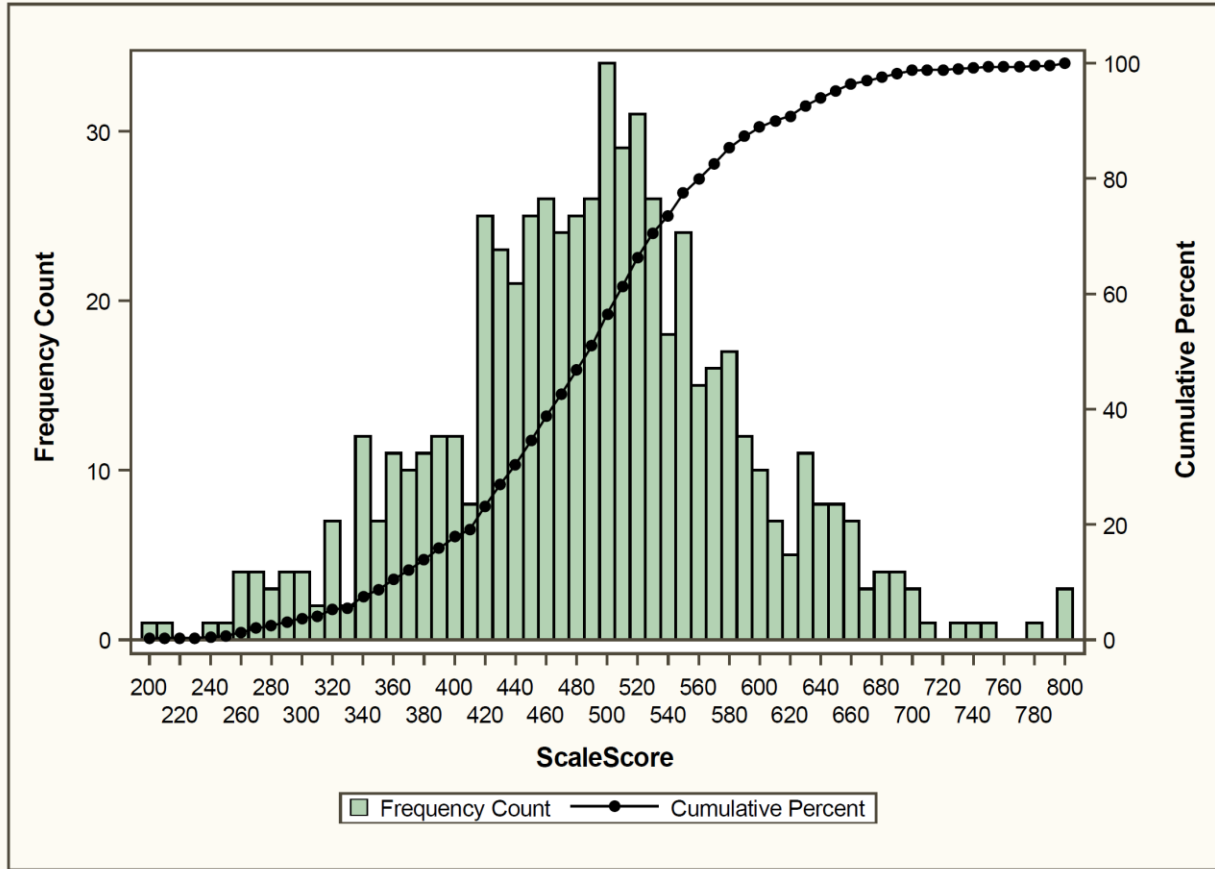*Frequency distribution for the ADAT Overall scale: 2022*
(612 administrations)
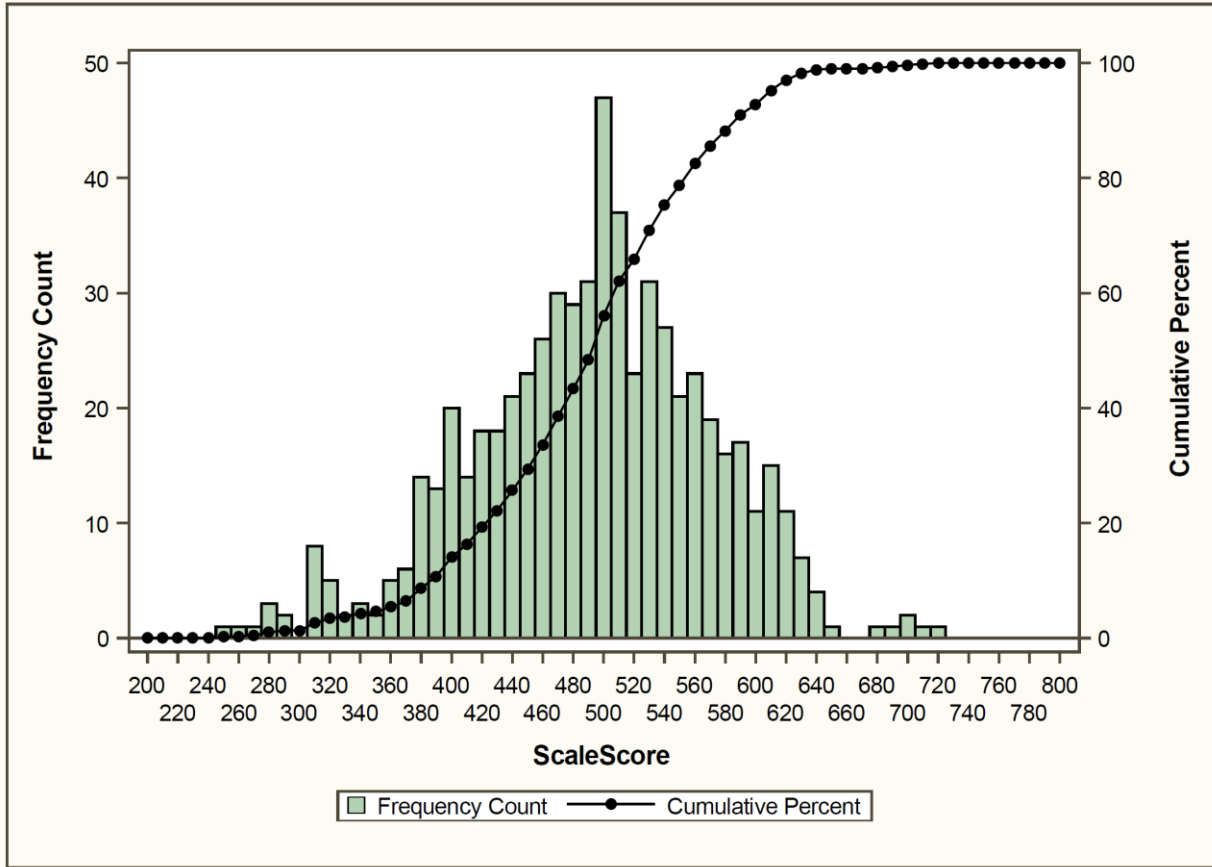
Frequency distribution for the Biomedical Sciences scale: 2022
(612 administrations)
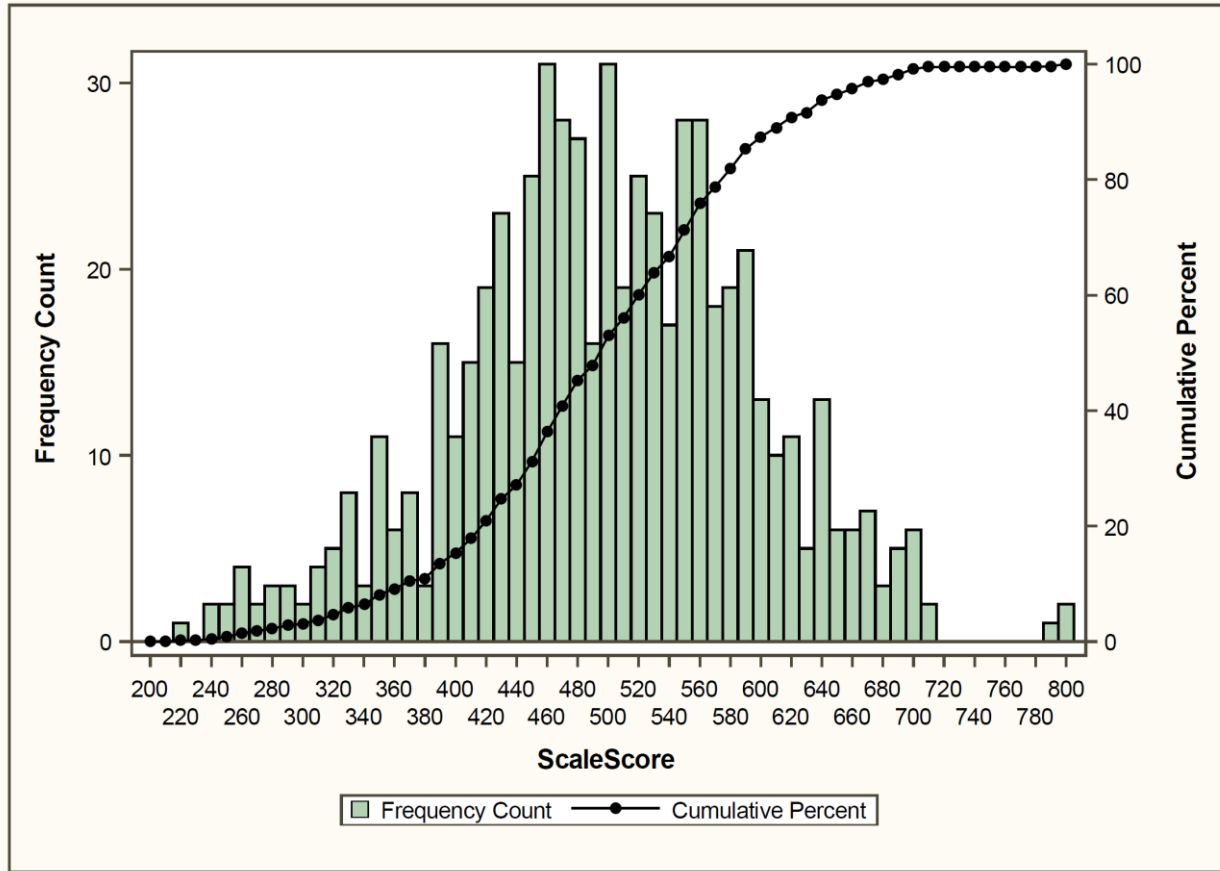
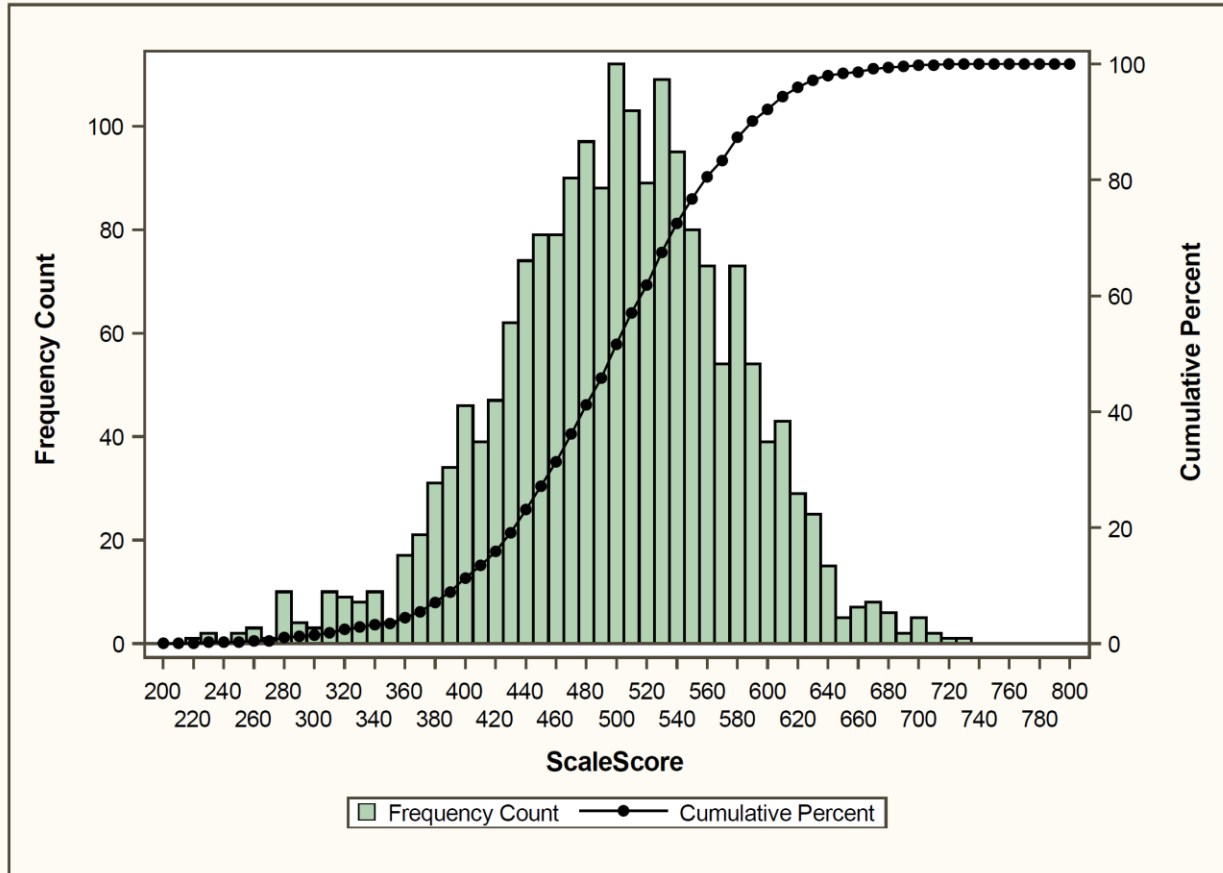*Frequency distribution for the Clinical Sciences scale: 2022*
(612 administrations)

Frequency distribution for the Data, Research Interpretation, & Evidence Based Dentistry scale: 2022
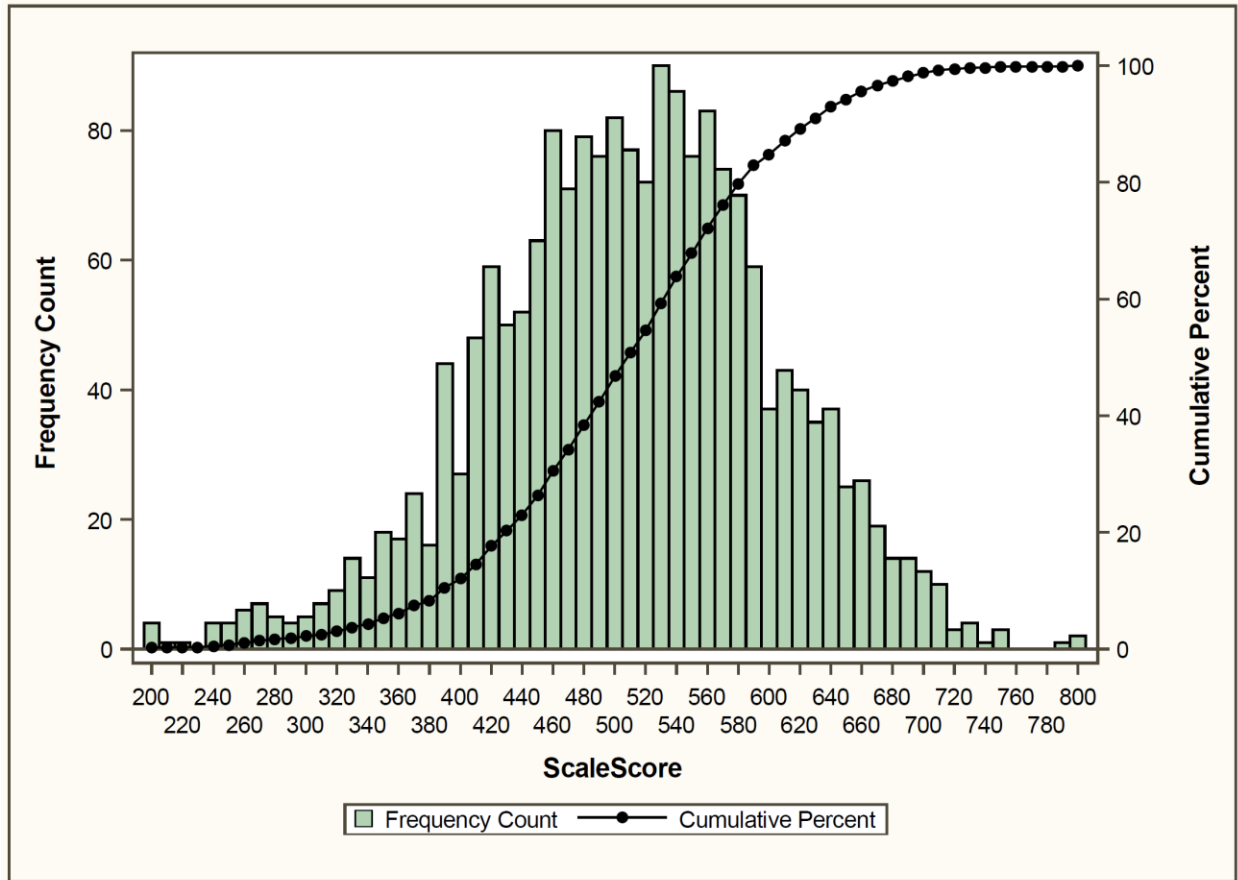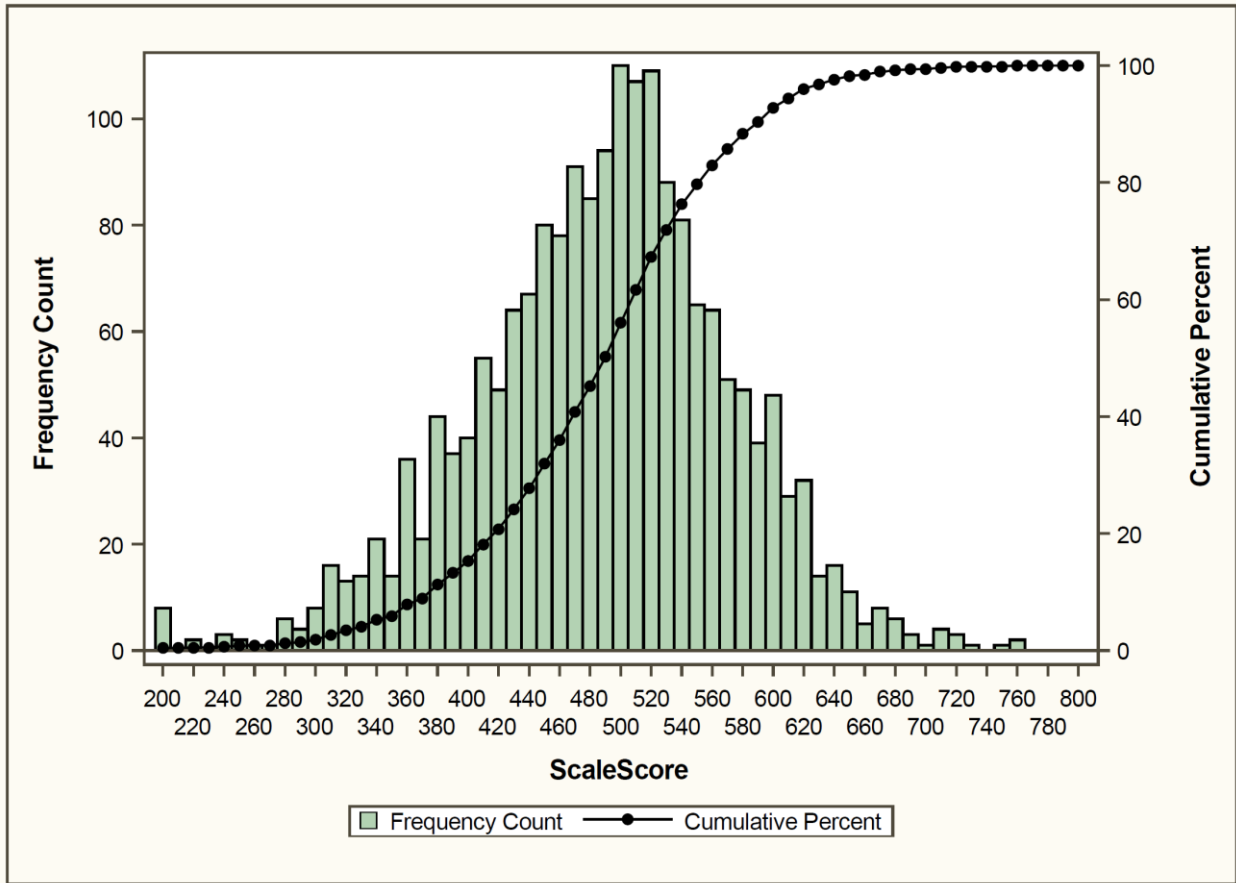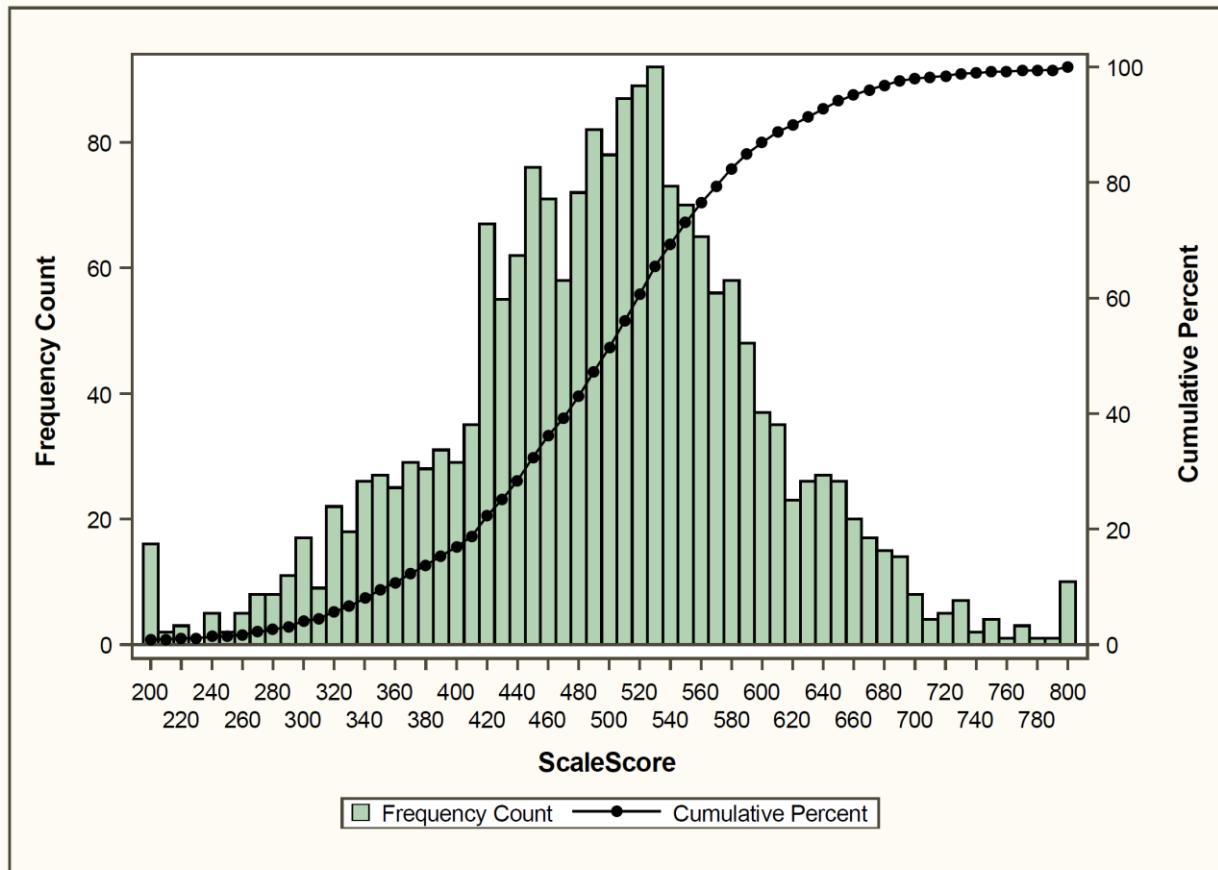*(612 administrations)*

Appendix A2: Frequency Distributions for ADAT Scale Scores: 2018-2022

Frequency distribution for the ADAT Overall scale: 2018-2022
(1,901 administrations)

Frequency distribution for the Biomedical Sciences scale: 2018-2022
(1,901 administrations)

Frequency distribution for the Clinical Sciences scale: 2018-2022

(1,901 administrations)

Frequency distribution for the Data, Research Interpretation, & Evidence Based Dentistry scale:
2018-2022
(1,901 administrations)

Appendix B1: Percentiles Associated with ADAT Scale Scores: 2022
(612 administrations)

ADAT=ADAT Overall; BIO=Biomedical Sciences; CLI=Clinical Sciences;
DRI=Data, Research Interpretation, & Evidence Based Dentistry;

Scale Score	ADAT	BIO	CLI	DRI
800		99		99
790		99		99
780		99		99
770		99		99
760		99		99
750		99		99
740		99		99
730		99		99
720	99	99	99	99
710	99	99	99	99
700	99	99	99	99
690	99	98	99	98
680	99	97	99	98
670	99	97	99	97
660	99	96	99	96
650	99	95	99	95
640	99	94	99	94
630	98	92	98	93
620	97	91	97	91
610	95	89	96	90
600	93	87	94	89
590	91	85	92	87
580	88	82	90	85
570	86	79	87	83
560	83	76	85	80
550	79	71	82	77
540	75	67	79	74
530	71	64	74	71
520	66	60	68	66
510	62	56	64	61
500	56	53	58	57
490	48	48	52	51
480	43	45	47	47
470	39	41	42	43
460	34	36	36	39
450	29	31	32	34
440	26	27	26	30
430	22	25	22	27
420	19	21	19	23

Scale Score	ADAT	BIO	CLI	DRI
410	16	18	16	19
400	14	15	15	18
390	11	14	12	16
380	9	11	10	14
370	6	10	8	12
360	5	9	7	10
350	5	8	5	9
340	4	6	5	8
330	4	6	4	6
320	3	5	3	5
310	3	4	2	4
300	1	3	2	4
290	1	3	1	3
280	1	2	1	2
270	1	2	1	2
260	1	1	1	1
250	1	1	1	1
240		1	1	1
230		1	1	1
220		1	1	1
210			1	1
200			1	1

Appendix B2: Percentiles Associated with ADAT Scale Scores: 2018-2022
(1,901 administrations)

ADAT=ADAT Overall; BIO=Biomedical Sciences; CLI=Clinical Sciences
DRI=Data, Research Interpretation, & Evidence Based Dentistry

Scale Score	ADAT	BIO	CLI	DRI
800		99		99
790		99		99
780		99		99
770		99		99
760		99	99	99
750		99	99	99
740		99	99	99
730	99	99	99	99
720	99	99	99	98
710	99	99	99	98
700	99	99	99	98
690	99	98	99	98
680	99	97	99	97
670	99	97	99	96
660	99	96	98	95
650	98	94	98	94
640	98	93	98	93
630	97	91	97	91
620	96	89	96	90
610	94	87	94	89
600	92	85	93	87
590	90	83	90	85
580	87	80	88	82
570	83	76	86	79
560	81	72	83	76
550	77	68	80	73
540	73	64	76	69
530	68	59	72	65
520	62	55	67	61
510	57	51	62	56
500	52	47	56	51
490	46	42	50	47
480	41	38	45	43
470	36	34	41	39
460	31	31	36	36
450	27	26	32	32
440	23	23	28	28
430	19	20	24	25
420	16	18	21	22
410	13	15	18	19
400	11	12	15	17

Scale Score	ADAT	BIO	CLI	DRI
390	9	11	13	15
380	7	8	11	14
370	6	7	9	12
360	4	6	8	11
350	4	5	6	9
340	3	4	5	8
330	3	4	4	7
320	2	3	3	6
310	2	3	3	5
300	1	2	2	4
290	1	2	1	3
280	1	2	1	3
270	1	1	1	2
260	1	1	1	2
250	1	1	1	1
240	1	1	1	1
230	1	1	1	1
220	1	1	1	1
210		1	1	1
200		1	1	1

Appendix C1: Descriptive Statistics for ADAT Scale Scores, by Specialty: 2022

Specialty	N†	ADAT		BIO		CLI		DRI	
		MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Advanced Education in General Dentistry, 12 Months	129	481.3	76.7	490.5	102.9	478.6	75.2	467.0	84.2
Advanced Education in General Dentistry, 24 Months	173	475.7	79.8	492.6	104.6	467.6	78.2	457.1	84.0
Dental Anesthesiology	48	501.5	66.9	518.1	87.9	495.2	60.6	479.8	87.3
Dental Public Health	51	503.3	65.6	521.4	89.4	495.7	58.8	482.7	75.1
Endodontics	235	511.4	71.5	508.9	85.2	510.3	72.2	519.0	98.2
General Practice Residency, 12 Months	105	501.0	76.4	509.8	101.5	494.1	70.8	494.9	90.6
General Practice Residency, 24 Months	105	486.4	72.8	498.9	97.3	481.0	69.5	470.2	78.0
Oral and Maxillofacial Surgery Clinical Fellowships Cosmetic	43	486.3	73.7	502.8	100.1	484.0	64.9	457.9	80.1
Oral and Maxillofacial Surgery Clinical Fellowships Craniofacial	41	491.5	74.5	508.5	102.1	488.0	64.9	464.4	85.3
Oral and Maxillofacial Surgery Clinical Fellowships Oncology	38	496.3	65.4	515.3	91.8	489.5	55.7	473.4	85.1
Maxillofacial Prosthetics	47	495.1	63.8	511.9	90.1	492.3	58.4	467.9	71.5
Prosthodontics/Maxillofacial Prosthetics	56	493.8	61.8	508.9	85.1	488.9	57.6	473.8	73.5
Oral and Maxillofacial Pathology	46	489.1	67.0	507.6	90.6	483.3	60.3	465.0	74.6
Oral and Maxillofacial Radiology	52	491.9	61.2	508.3	87.2	487.3	54.9	468.3	70.6
Oral and Maxillofacial Surgery	58	483.3	72.3	496.6	99.1	479.1	68.4	464.0	80.8
Oral Medicine	59	490.7	68.3	505.4	95.3	488.0	64.6	467.3	76.9

Orofacial Pain	62	495.0	64.5	510.3	85.4	488.4	60.7	477.3	85.0
Clinical Fellowship in Craniofacial and Special Care Orthodontics	44	495.9	75.6	510.9	98.5	492.3	70.9	473.2	81.1
Orthodontics and Dentofacial Orthopedics	76	493.8	63.4	508.6	84.6	488.6	59.2	476.3	83.2
Orthodontics/Periodontics	75	489.5	69.6	502.0	93.8	486.4	61.8	468.8	82.6
Pediatric Dentistry	80	486.5	74.8	498.5	93.8	482.0	70.8	472.4	88.4
Periodontics	85	496.0	68.0	507.3	90.5	491.5	65.7	481.3	85.4
Prosthodontics	77	490.0	66.6	500.5	86.8	486.9	63.9	473.5	77.5

Note. ADAT=ADAT Overall, BIO=Biomedical Sciences; CLI=Clinical Sciences, DRI=Data, Research Interpretation, & Evidence Based Dentistry; Norms are presented only for specialties selected by 25 or more candidates.
[†]Represents the number of candidates who reported interest in the specialty. Candidates could pick multiple specialties.

Appendix C2: Descriptive Statistics for ADAT Scale Scores, by Specialty: 2018-2022

SPECIALTY	N†	ADAT		BIO		CLI		DRI	
		MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Advanced Education in General Dentistry, 12 Months	314	487.7	76.9	504.4	97.9	474.8	82.4	478.2	95.8
Advanced Education in General Dentistry, 24 Months	349	472.1	81.3	496.3	103.0	456.9	85.0	452.6	93.7
Dental Anesthesiology	87	490.8	76.5	508.4	94.3	480.5	83.2	474.6	95.0
Dental Public Health	95	491.1	73.1	515.1	88.7	475.2	81.8	474.5	90.5
Endodontics	808	514.8	73.5	516.4	88.1	507.9	79.1	525.4	98.5
General Practice Residency, 12 Months	278	502.6	76.2	517.8	94.0	488.4	82.2	498.9	96.2
General Practice Residency, 24 Months	216	485.6	75.3	506.5	98.2	472.2	78.4	468.7	91.4
Oral and Maxillofacial Surgery Clinical Fellowships Cosmetic	74	486.8	79.0	507.3	94.4	478.9	81.9	459.5	92.6
Oral and Maxillofacial Surgery Clinical Fellowships Craniofacial	72	487.5	80.4	510.6	95.0	477.4	84.6	460.1	97.5
Oral and Maxillofacial Surgery Clinical Fellowships Oncology	67	489.4	73.8	513.4	85.8	477.8	80.4	464.0	97.4
Maxillofacial Prosthetics	76	487.6	72.9	507.6	88.2	480.4	78.6	461.3	85.7
Prosthodontics/Maxillofacial Prosthetics	110	493.5	68.1	517.9	82.0	480.5	76.8	471.1	87.3
Oral and Maxillofacial Pathology	81	477.7	75.7	496.8	90.8	464.9	83.8	463.6	90.2
Oral and Maxillofacial Radiology	88	482.2	71.3	501.7	85.8	471.4	81.3	462.8	85.7
Oral and Maxillofacial Surgery	123	478.5	78.3	497.2	93.8	467.8	84.1	461.1	97.0
Oral Medicine	98	482.4	71.8	498.9	90.9	475.2	77.7	463.5	87.2
Orofacial Pain	98	493.1	71.3	512.6	86.3	480.5	77.4	478.2	93.5

SPECIALTY	N†	ADAT		BIO		CLI		DRI	
		MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Clinical Fellowship in Craniofacial and Special Care Orthodontics	83	488.0	76.4	508.4	91.5	477.8	85.8	467.1	88.2
Orthodontics and Dentofacial Orthopedics	242	505.9	75.1	517.9	87.4	499.7	79.6	495.1	101.3
Orthodontics/Periodontics	167	501.7	80.6	517.6	96.2	492.6	82.0	486.7	103.0
Pediatric Dentistry	285	486.1	72.5	498.6	87.0	479.1	79.8	475.9	95.2
Periodontics	211	493.8	76.8	511.3	92.2	481.8	79.7	481.4	101.8
Prosthodontics	188	479.0	79.2	491.9	95.1	474.7	82.6	460.7	100.5

Note. ADAT=ADAT Overall, BIO=Biomedical Sciences; CLI=Clinical Sciences, DRI=Data, Research Interpretation, & Evidence Based Dentistry;
Norms are presented only for specialties selected by 25 or more candidates.
†Represents the number of candidates who reported interest in the specialty. Candidates could pick multiple specialties.

Frequency distribution for the ADAT Overall scale: 2022
Advanced Education in General Dentistry, 12 Months
(129 administrations)
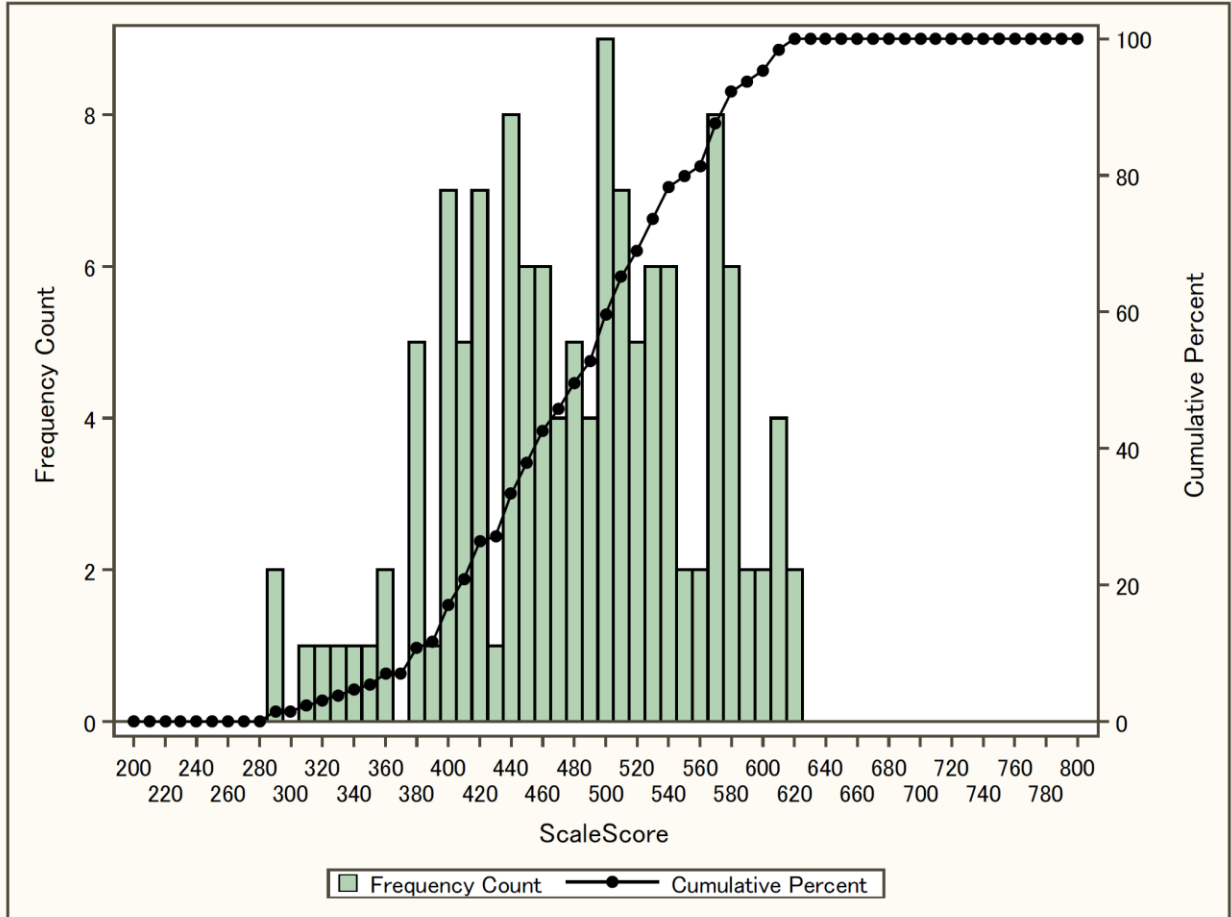
Frequency distribution for the ADAT Overall scale: 2022
Advanced Education in General Dentistry, 24 Months
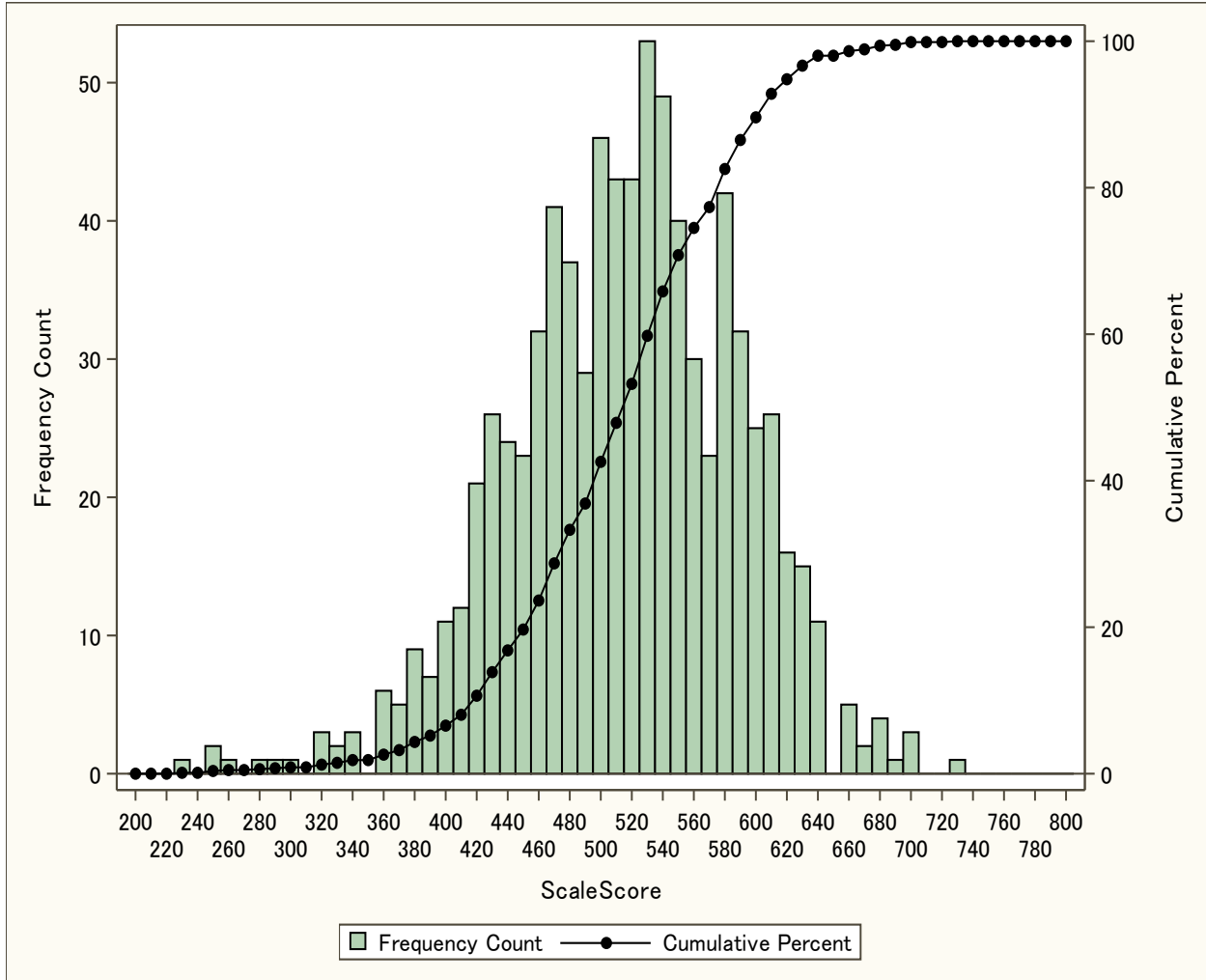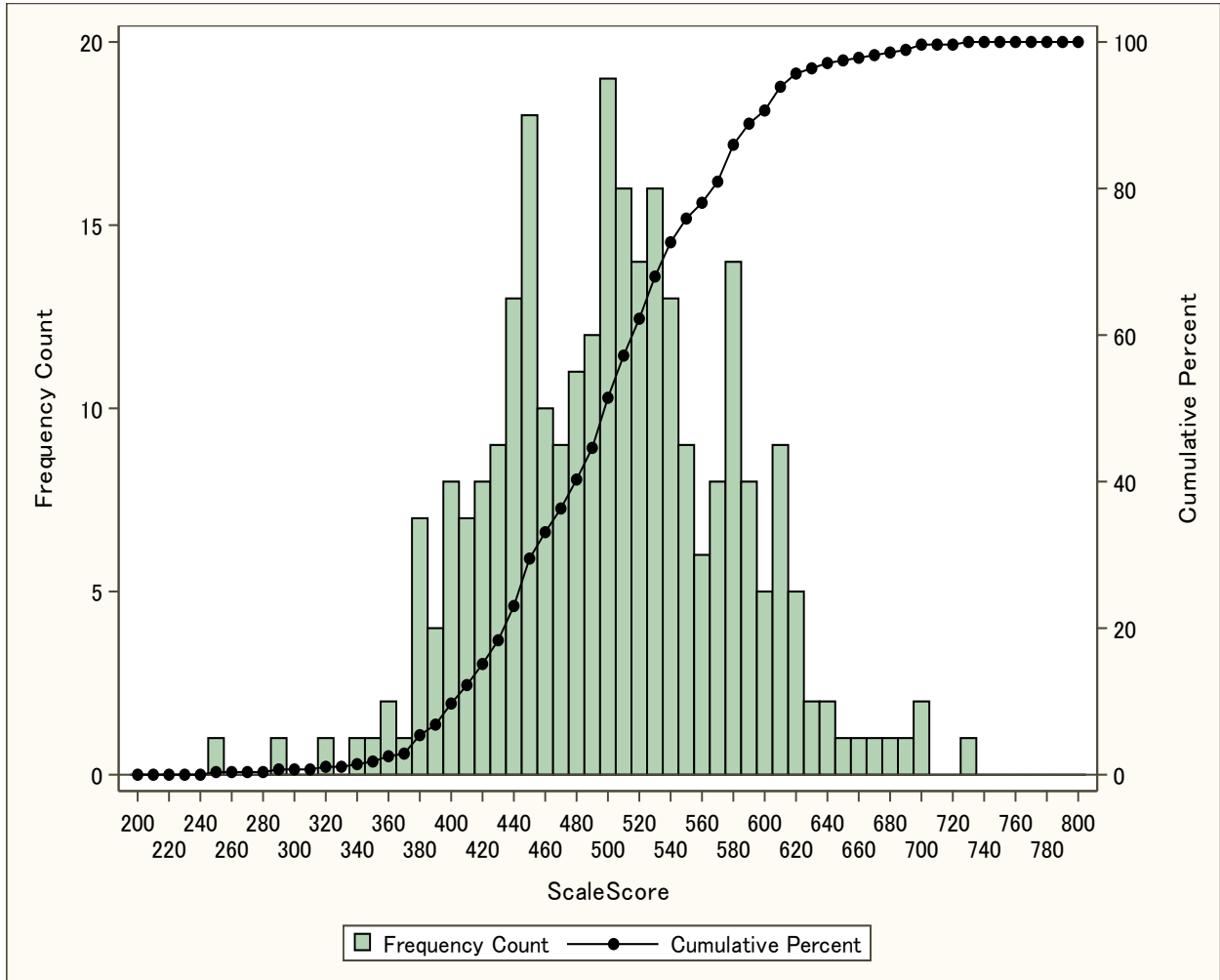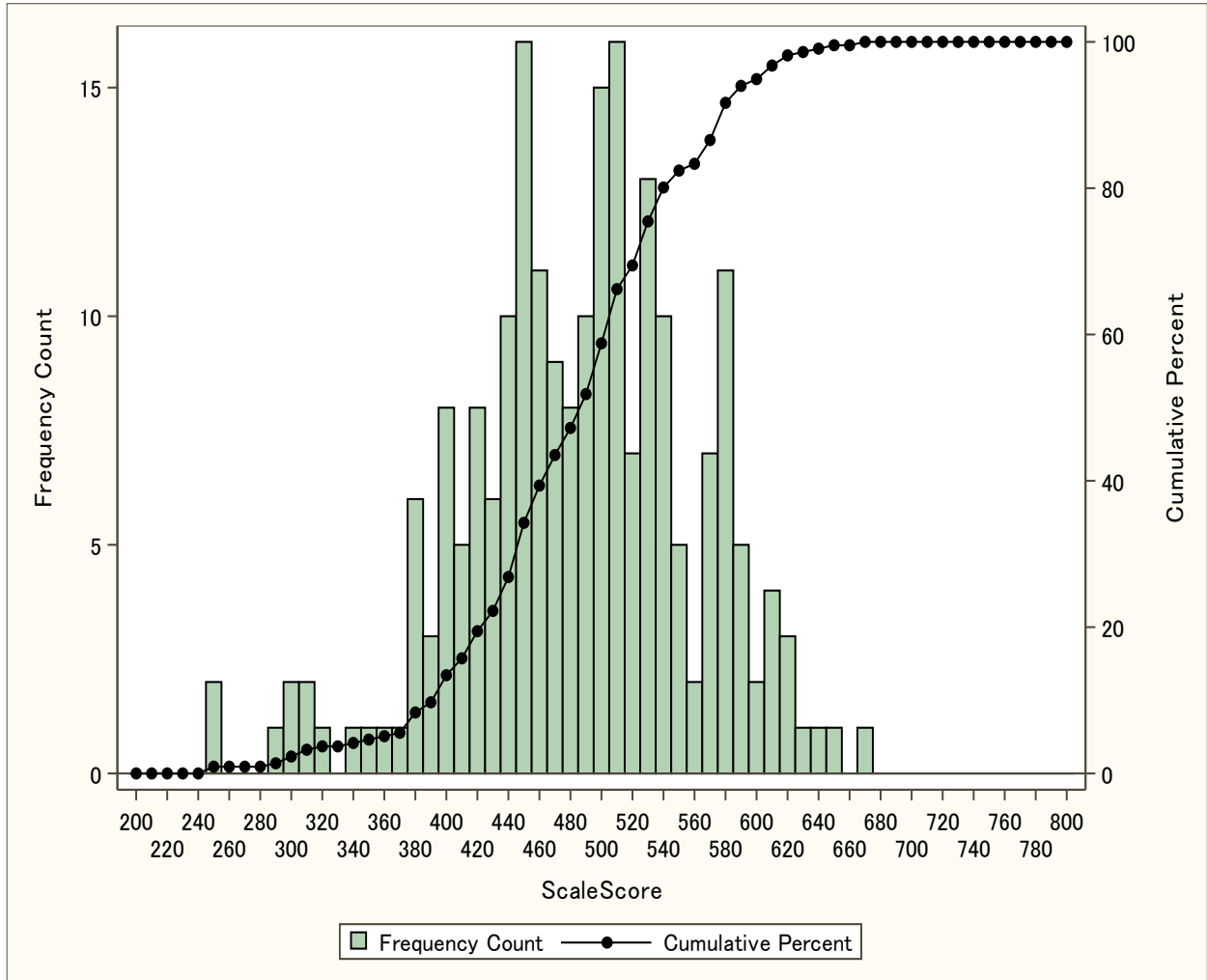*(173 administrations)*
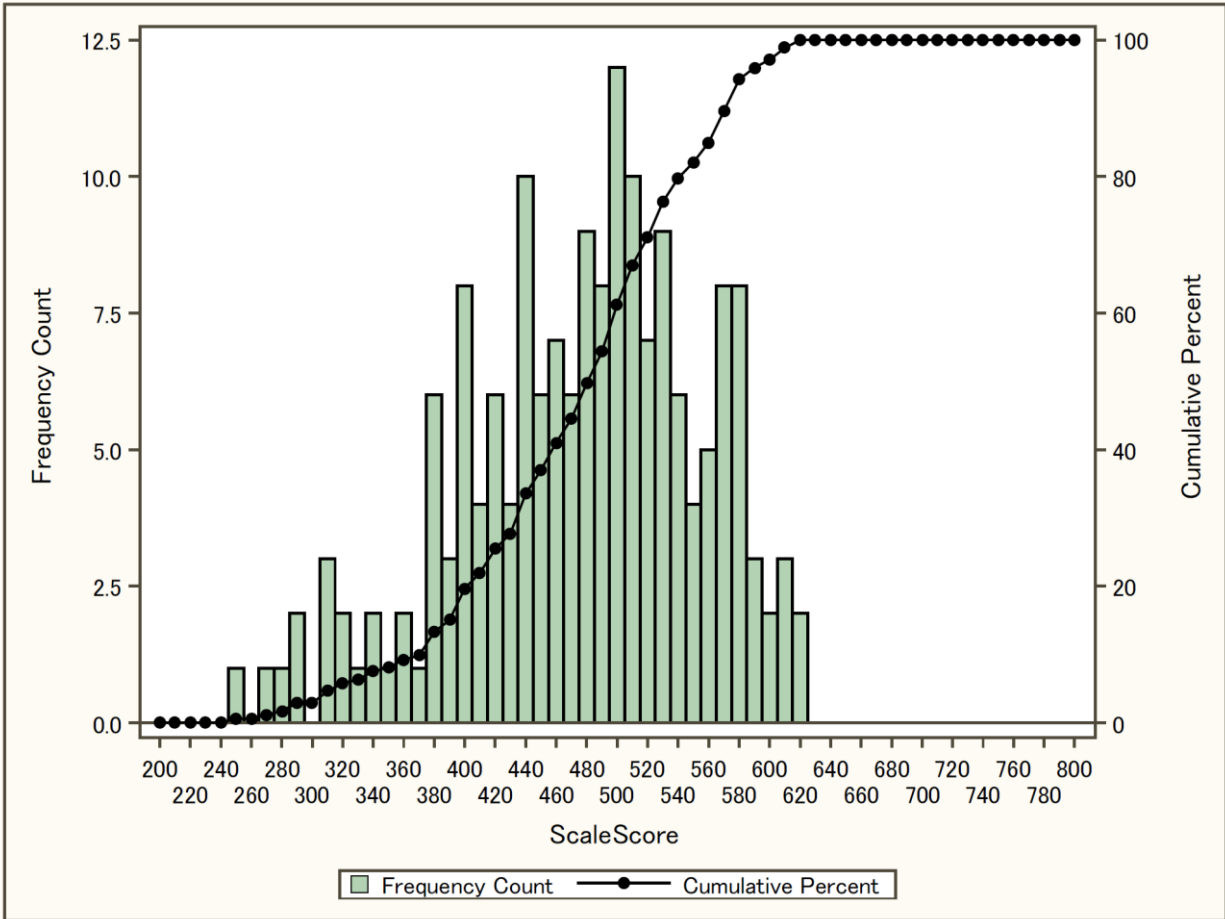
Frequency distribution for the ADAT Overall scale: 2022
Endodontics
(235 administrations)
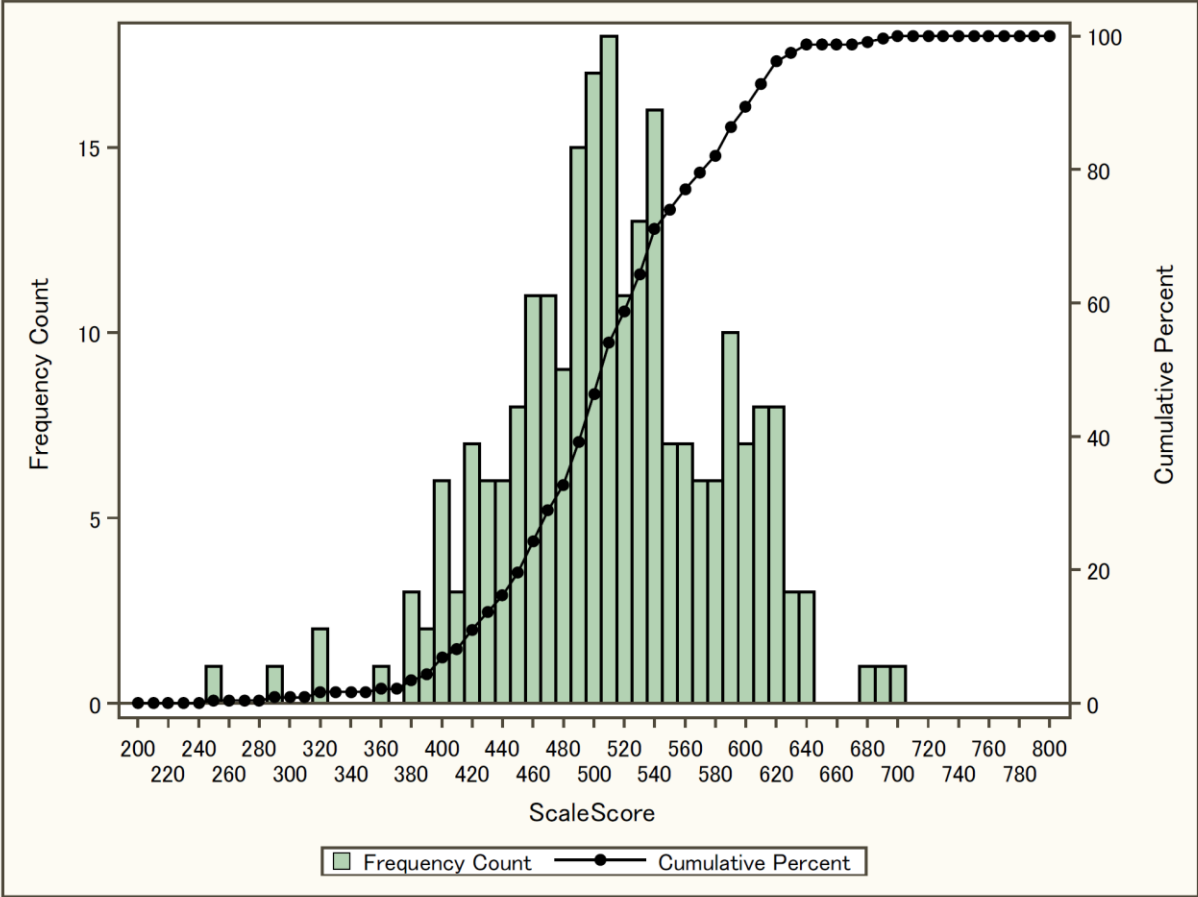
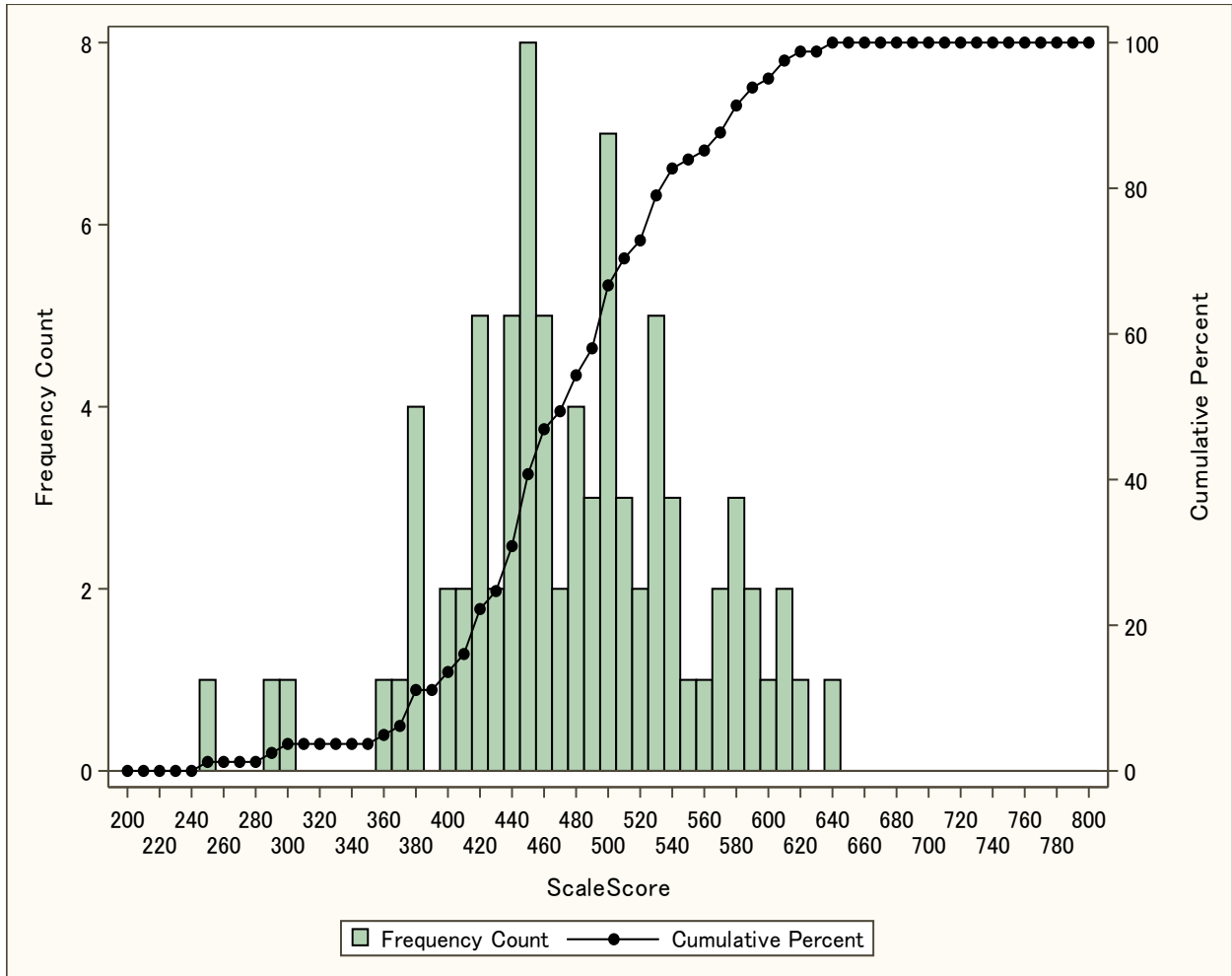Frequency distribution for the ADAT Overall scale: 2022
General Practice Residency, 12 Months
(105 administrations)
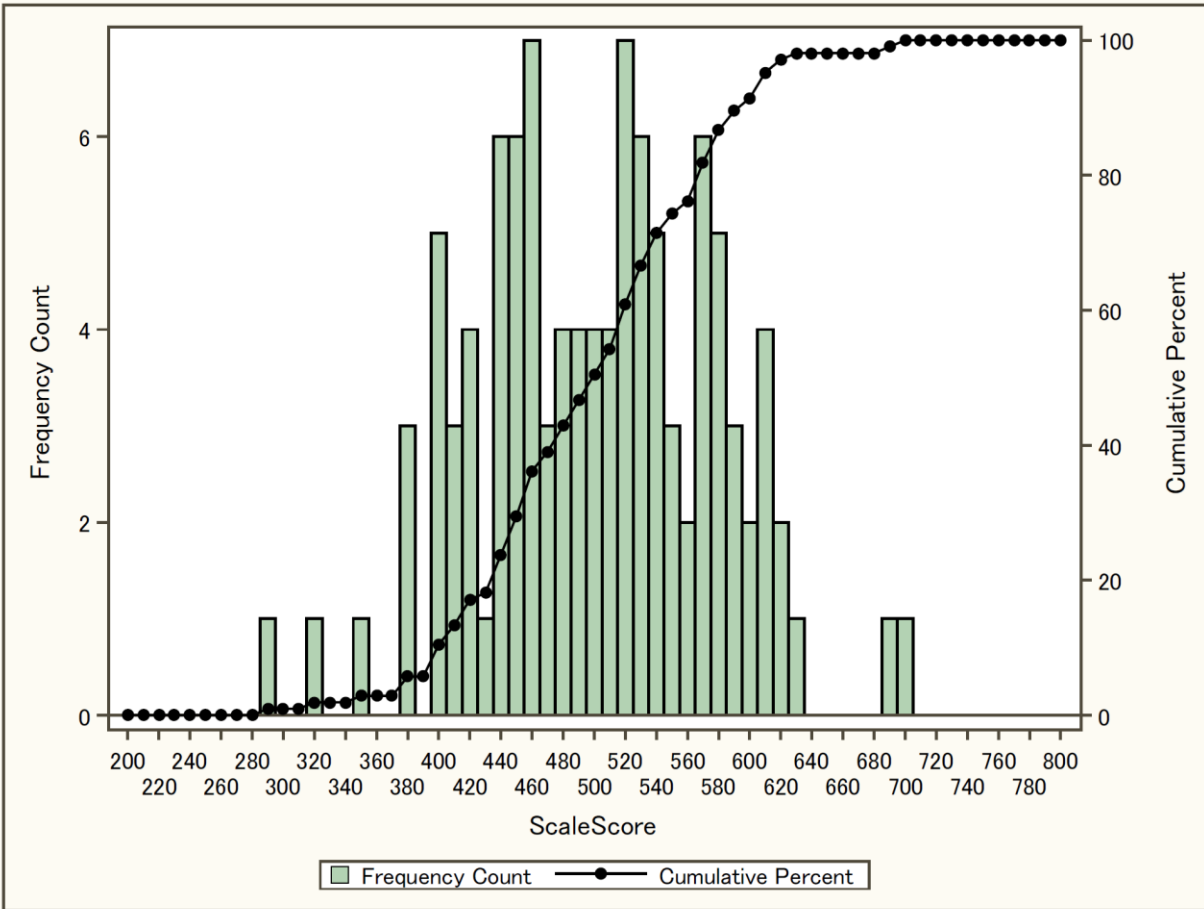
Frequency distribution for the ADAT Overall scale: 2022
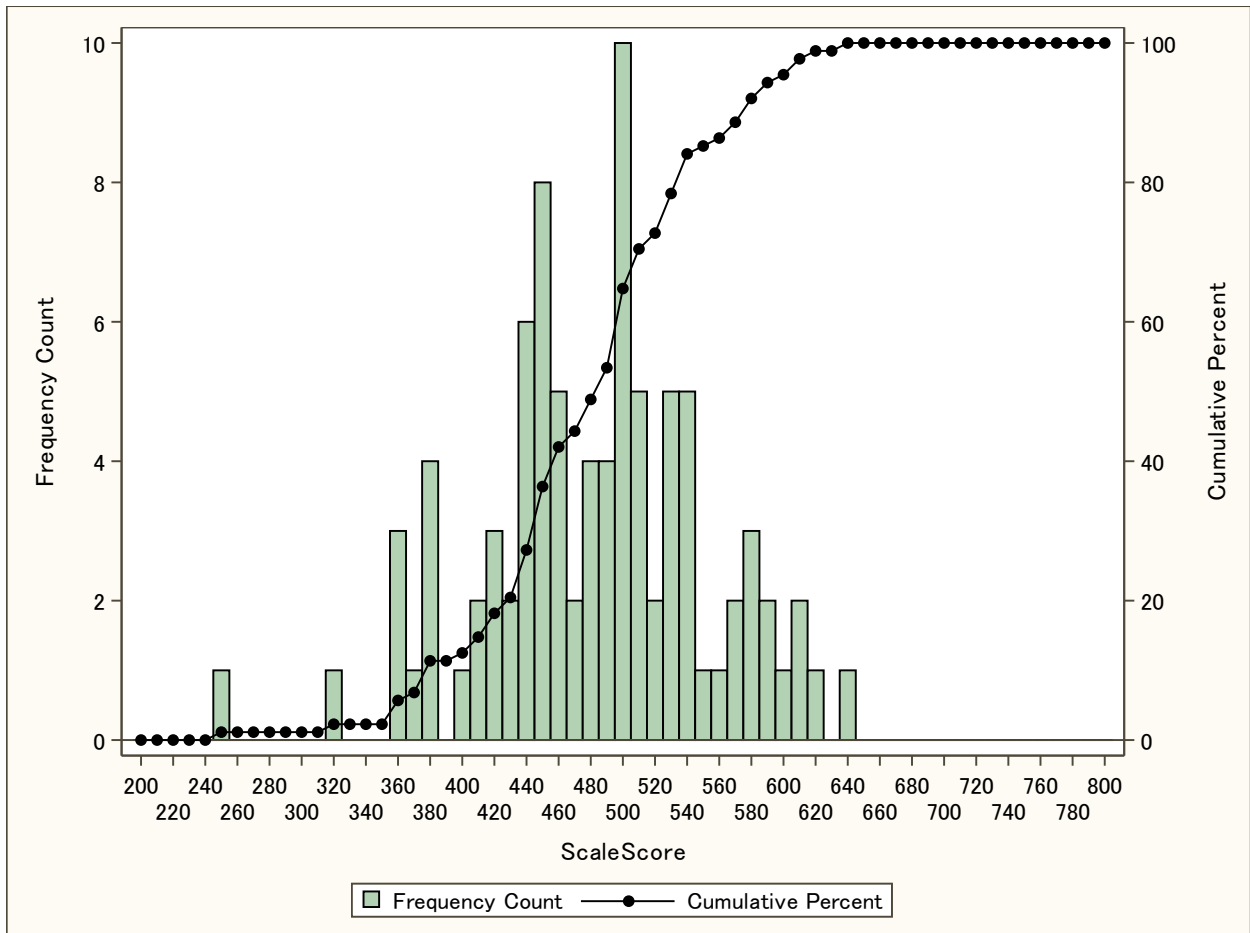*General Practice Residency, 24 Months*
(105 administrations)
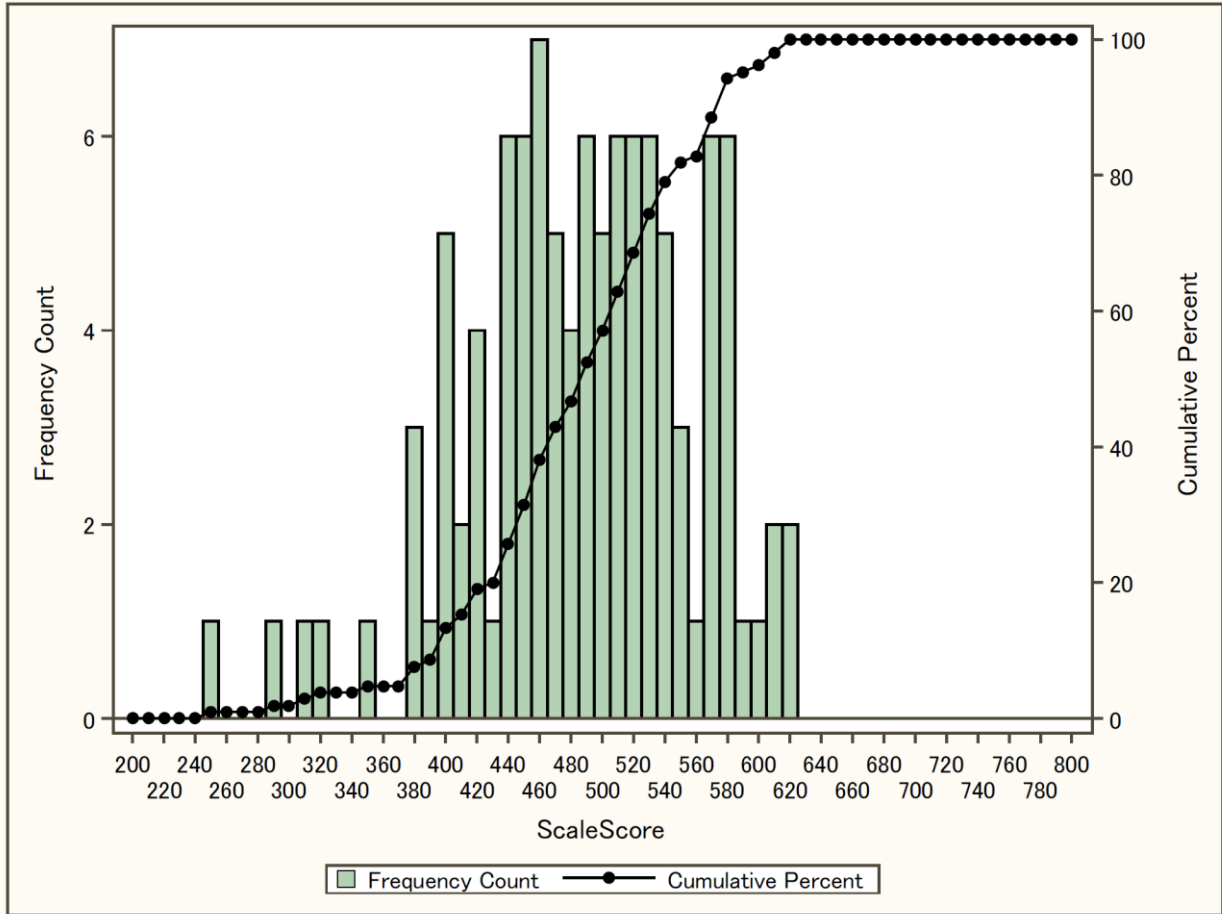
Frequency distribution for the ADAT Overall scale: 2022
Pediatric Dentistry
(80 administrations)
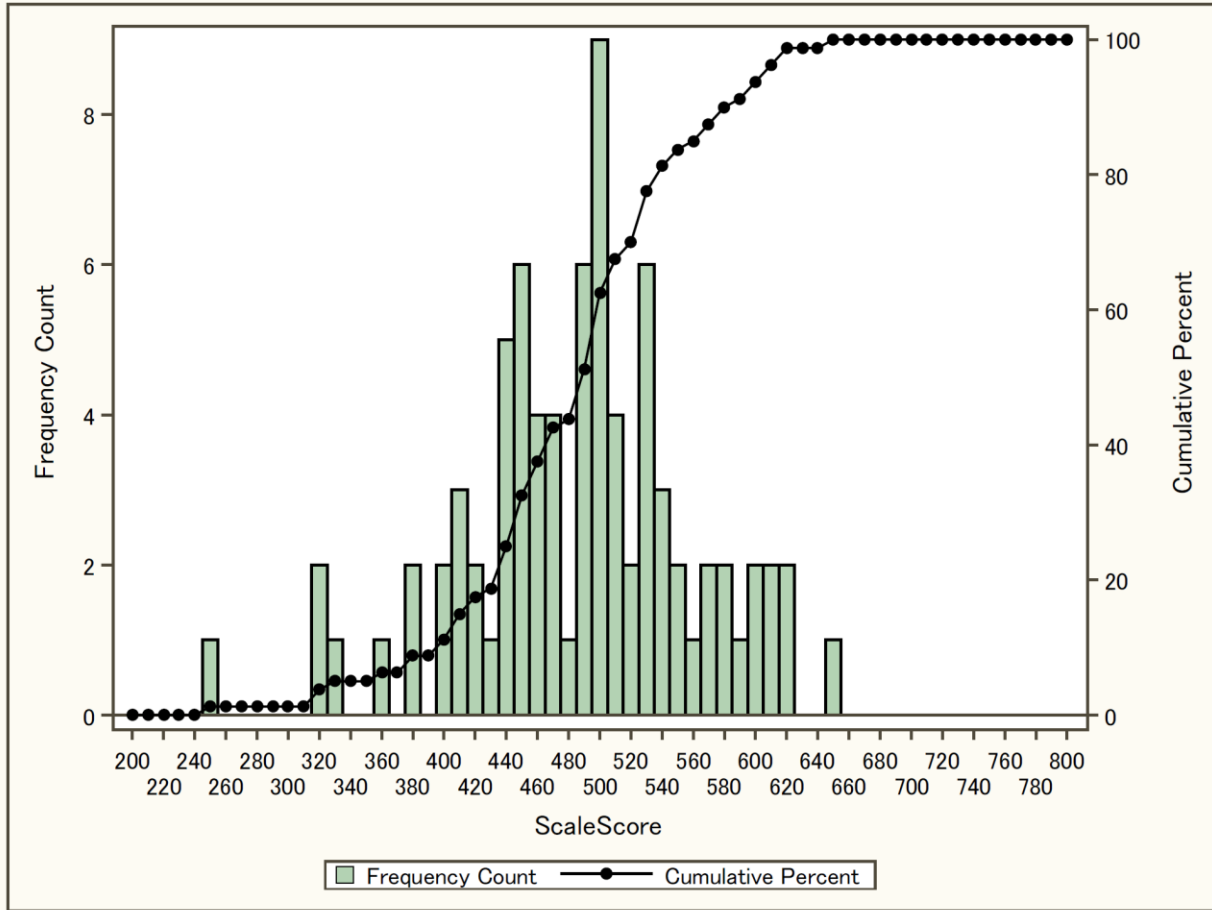
Frequency distribution for the ADAT Overall scale: 2022
Periodontics
(85 administrations)
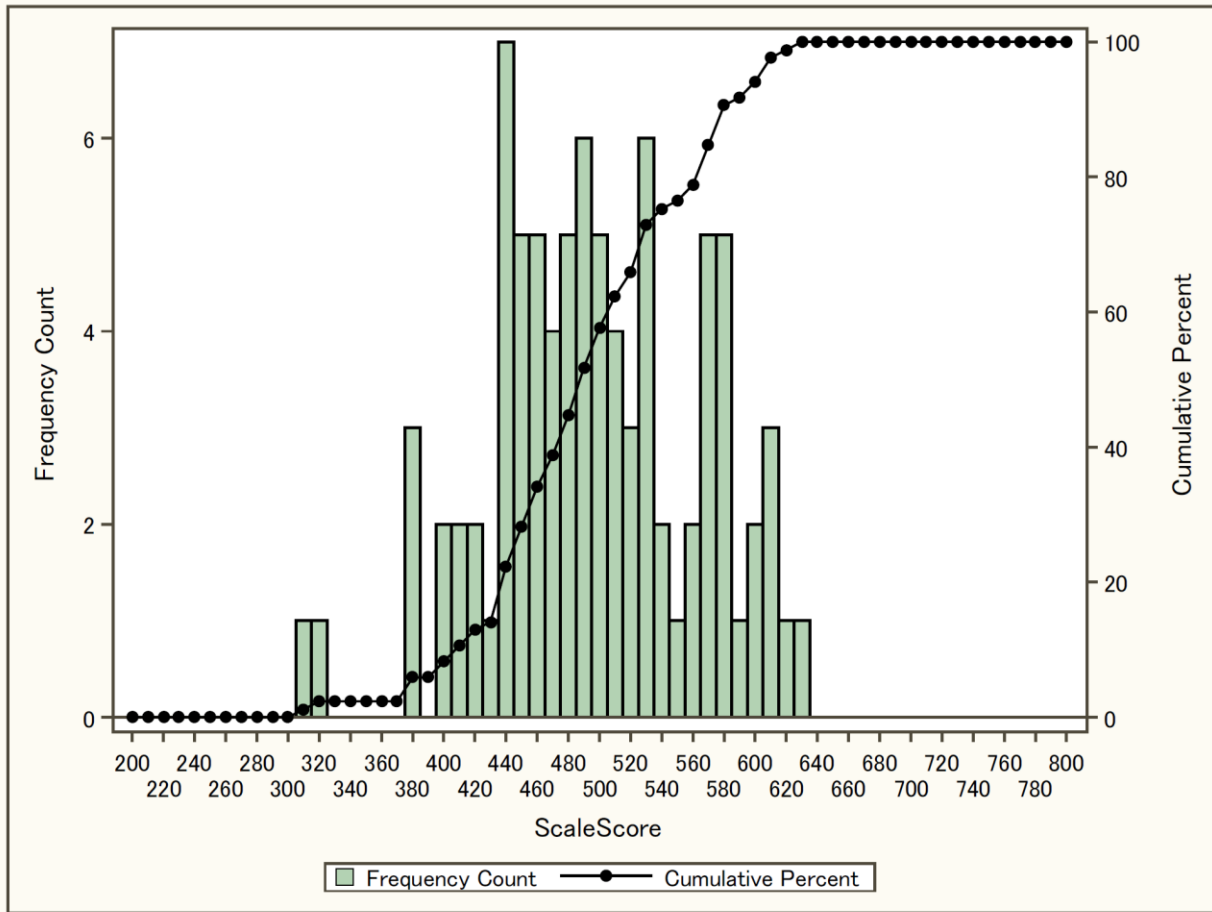
Appendix D2: Frequency Distributions for ADAT Overall Scales, by Specialty: 2018-2022
Note: Frequency distributions are provided for specialties selected by 80 or more candidates.

Frequency distribution for the ADAT Overall scale: 2018-2022
Advanced Education in General Dentistry, 12 Months
(314 administrations)
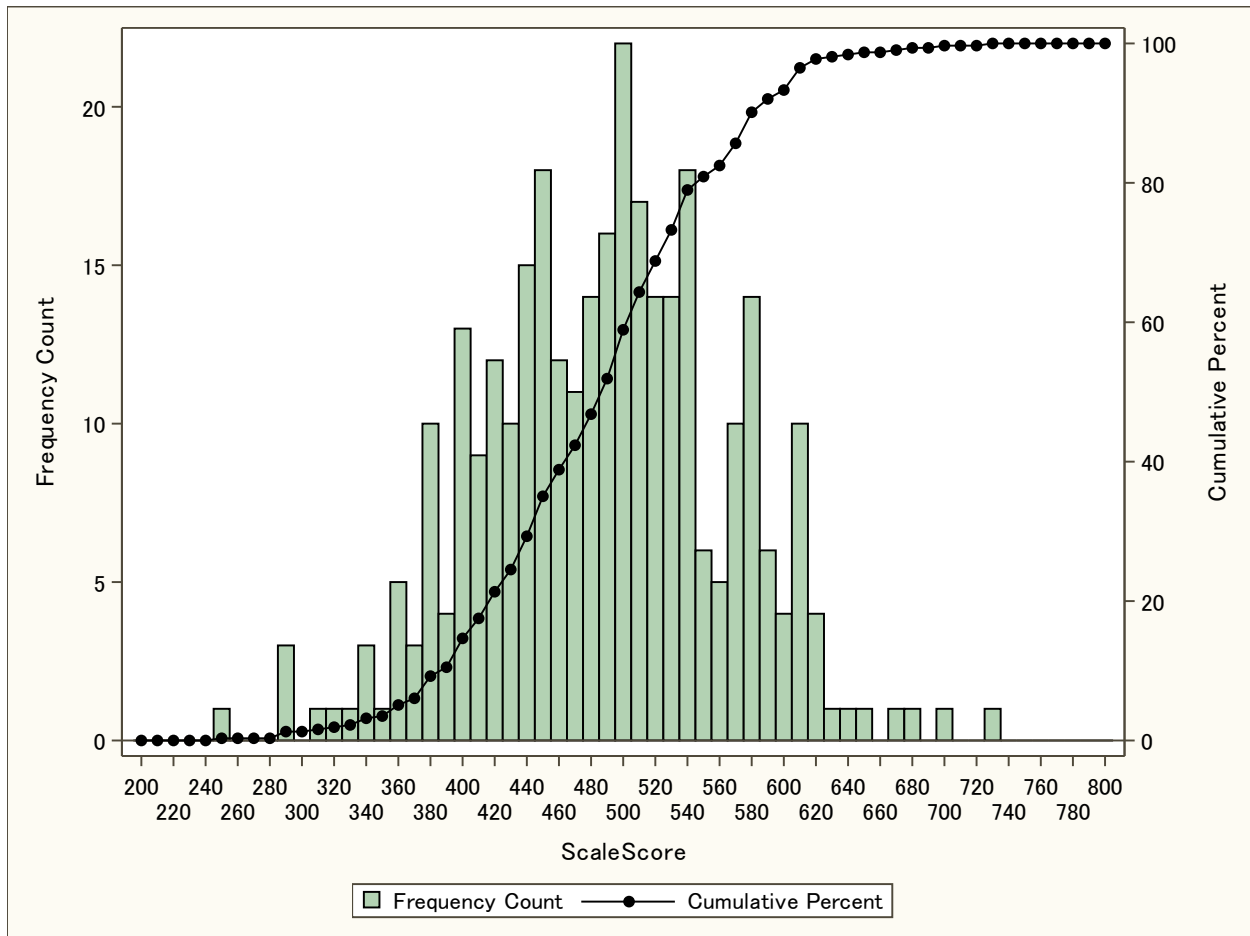
Frequency distribution for the ADAT Overall scale: 2018-2022
Advanced Education in General Dentistry, 24 Months
(349 administrations)
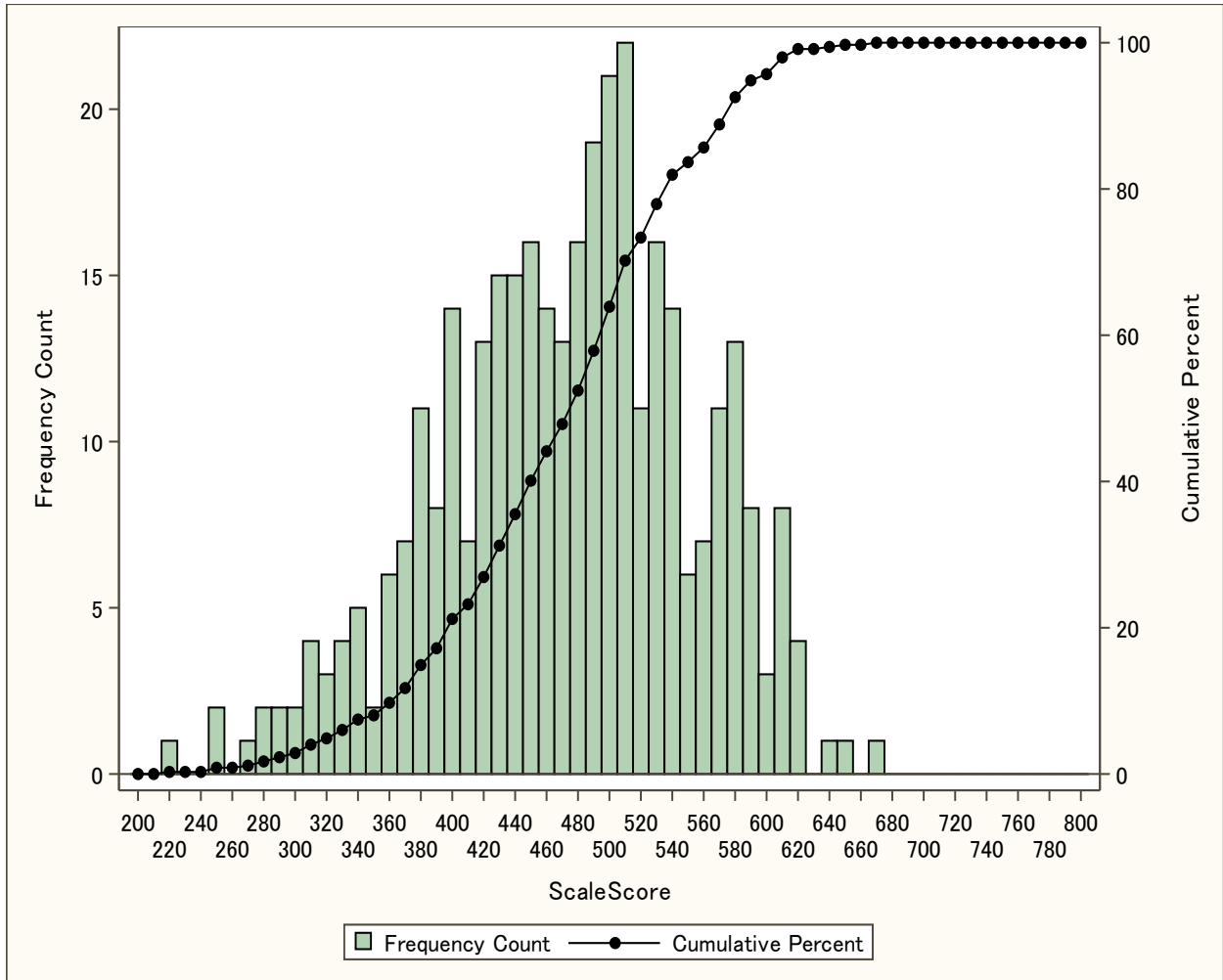
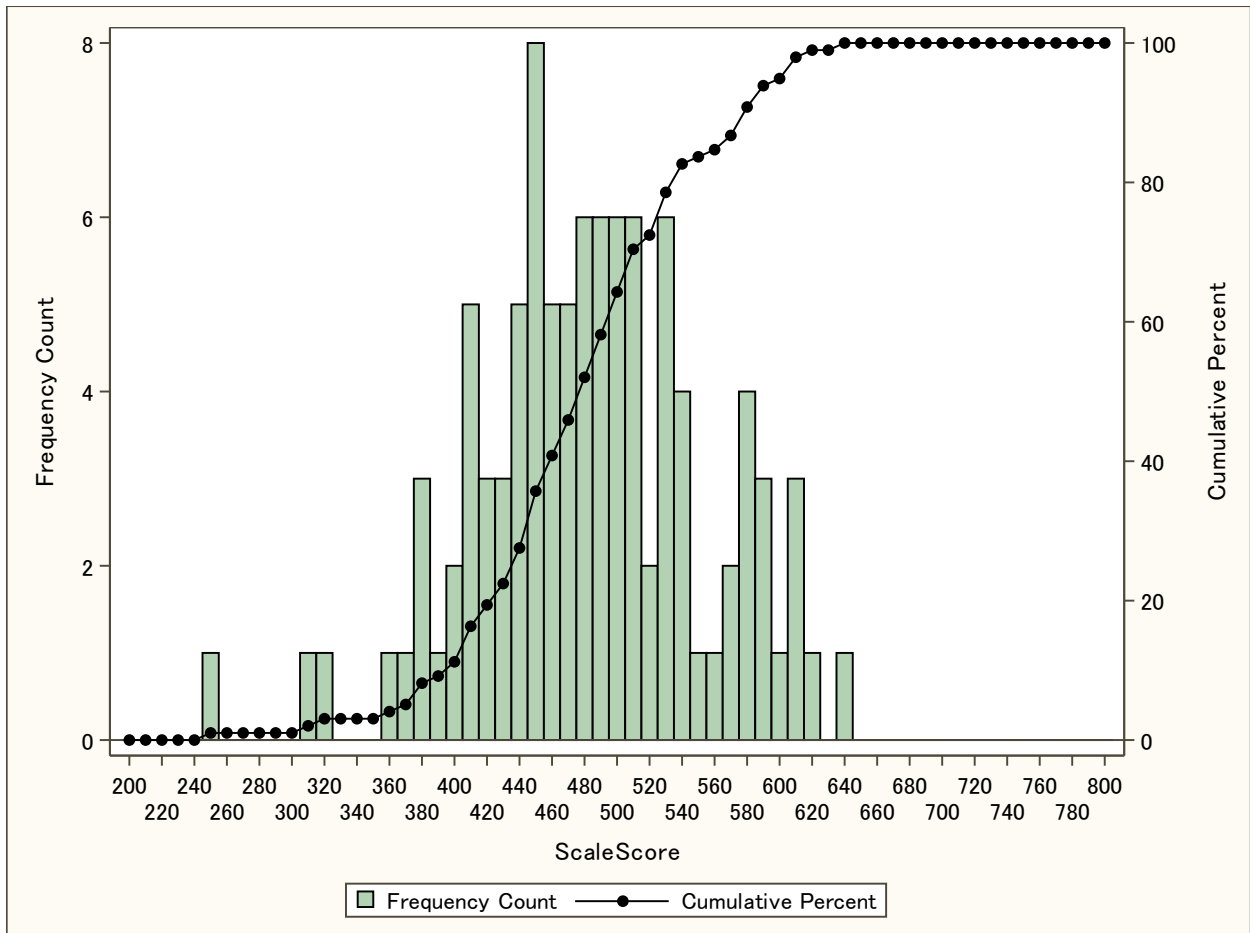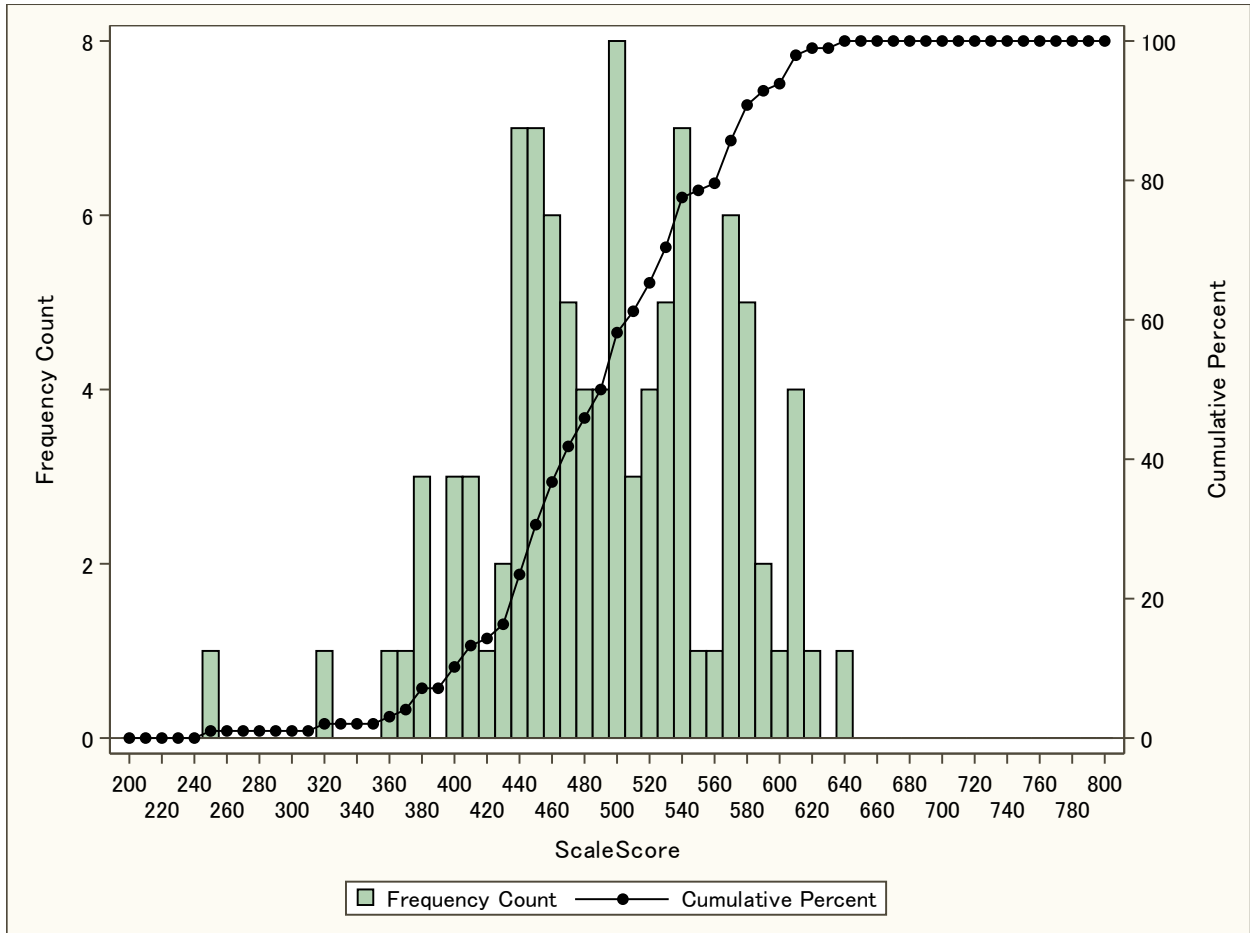*Frequency distribution for the ADAT Overall scale: 2018-2022*
Dental Anesthesiology
(87 administrations)
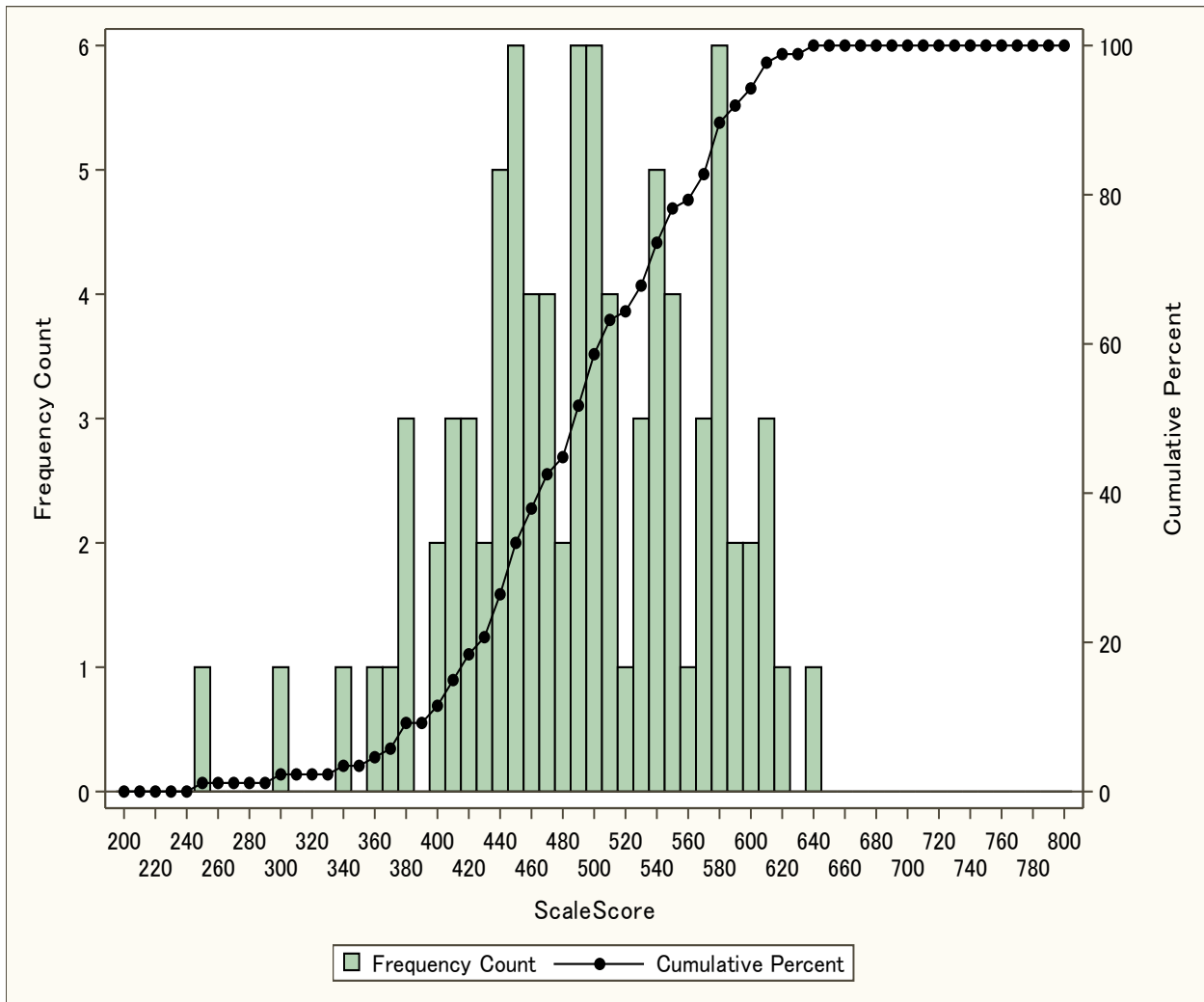
Frequency distribution for the ADAT Overall scale: 2018-2022
Dental Public Health
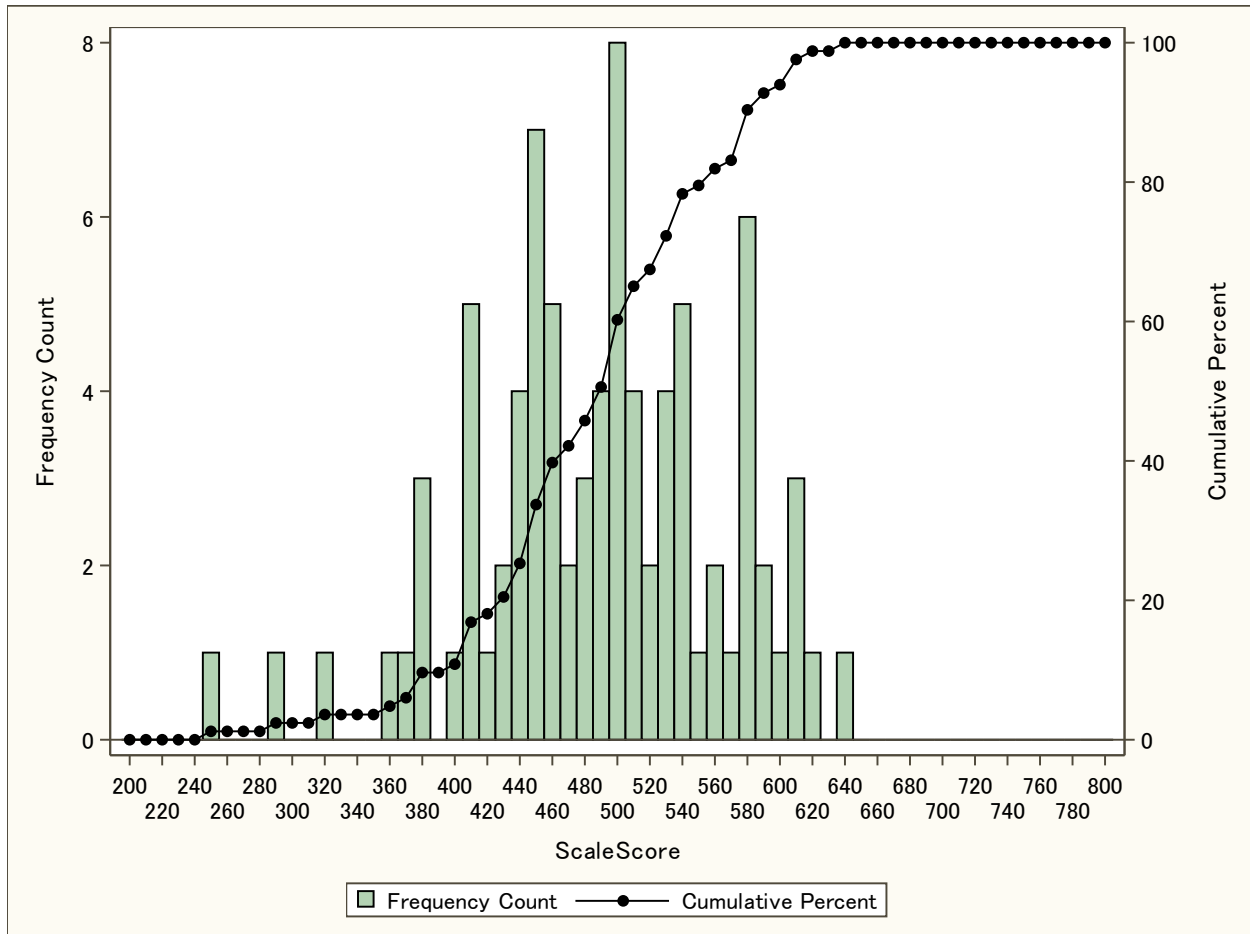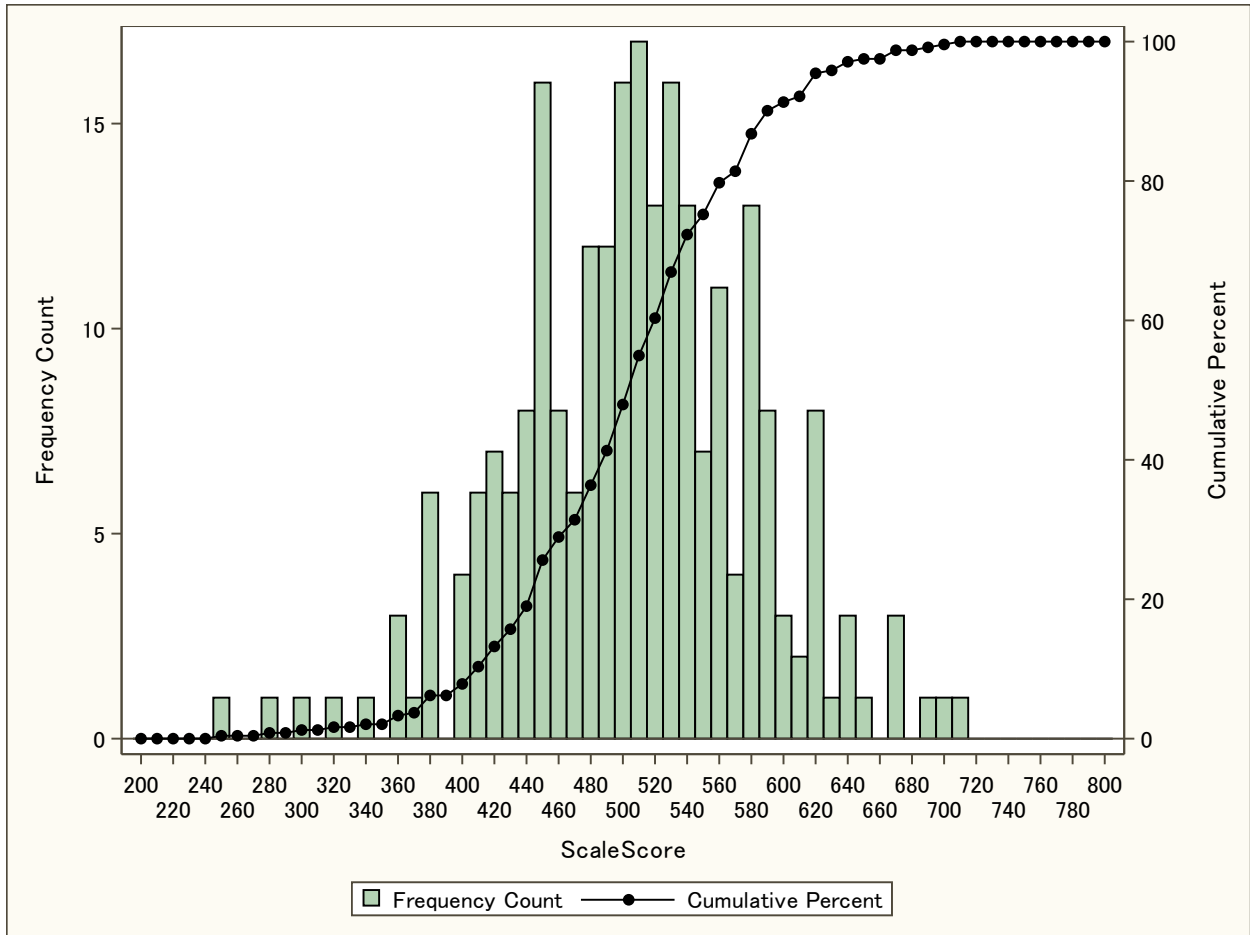*(95 administrations)*
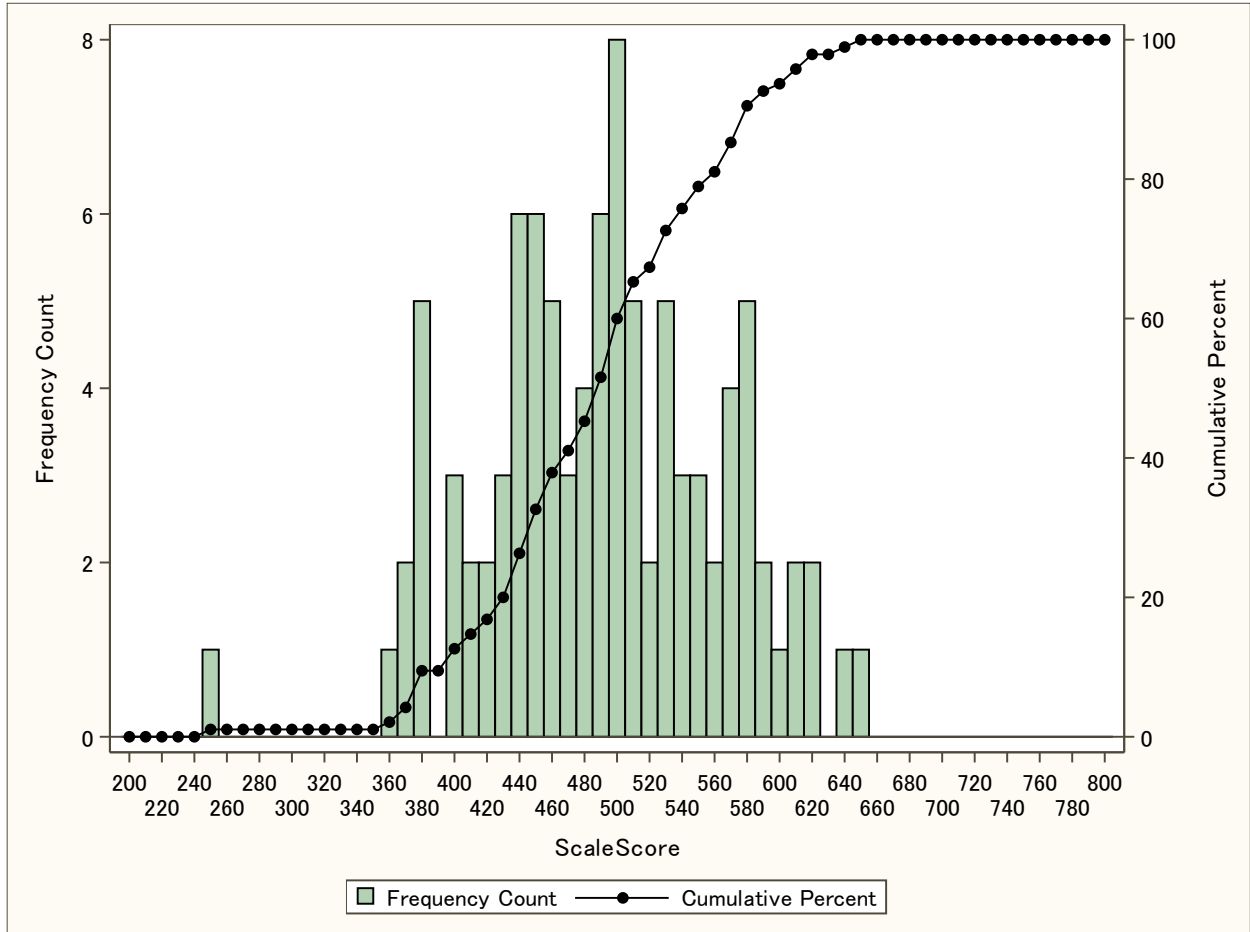
Frequency distribution for the ADAT Overall scale: 2018-2022
Endodontics
(808 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
General Practice Residency, 12 Months
(278 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
General Practice Residency, 24 Months
(216 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Prosthodontics/Maxillofacial Prosthetics
(110 administrations)
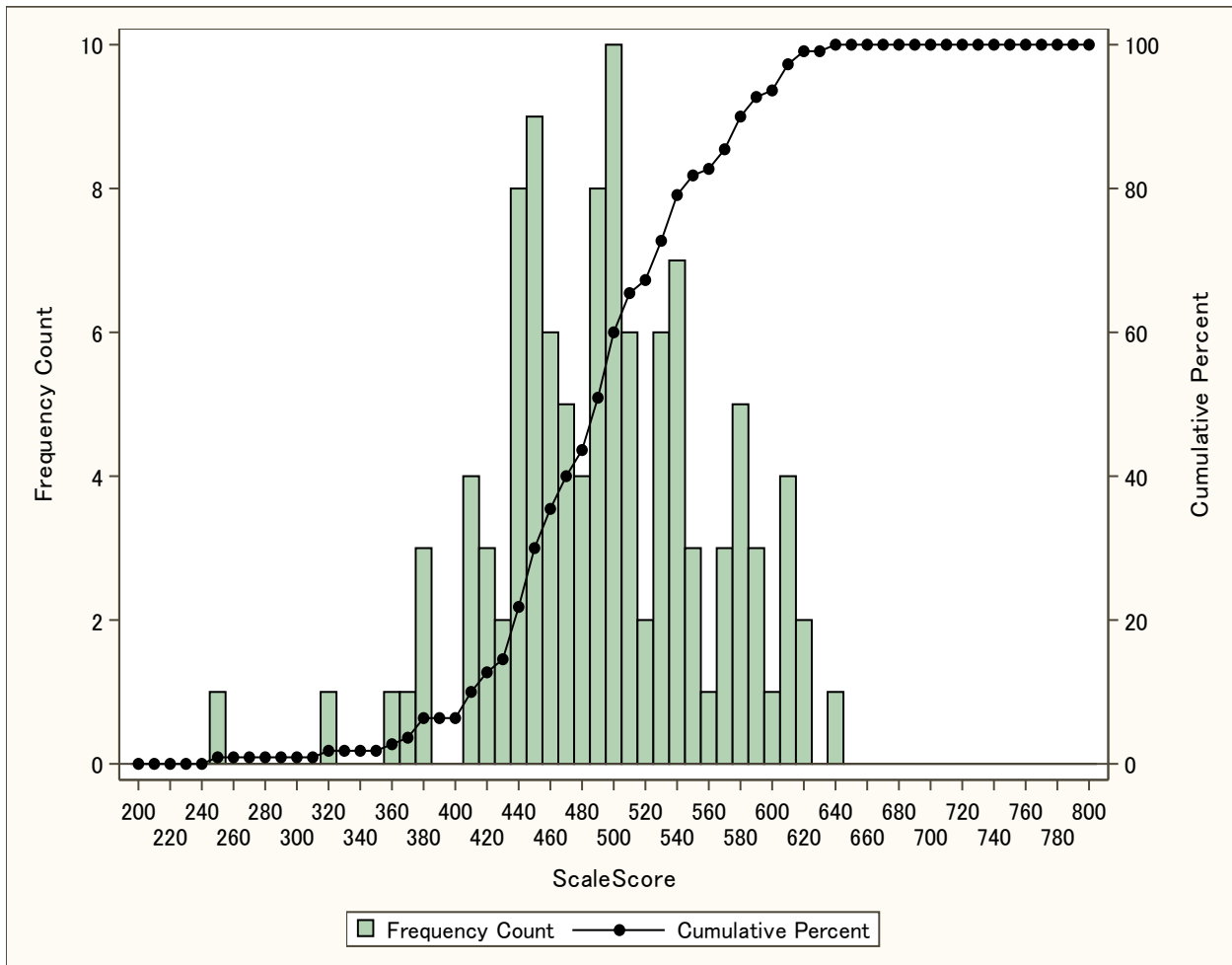
Frequency distribution for the ADAT Overall scale: 2018-2022
Oral and Maxillofacial Pathology
(81 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Oral and Maxillofacial Radiology
(88 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Oral and Maxillofacial Surgery
(123 administrations)
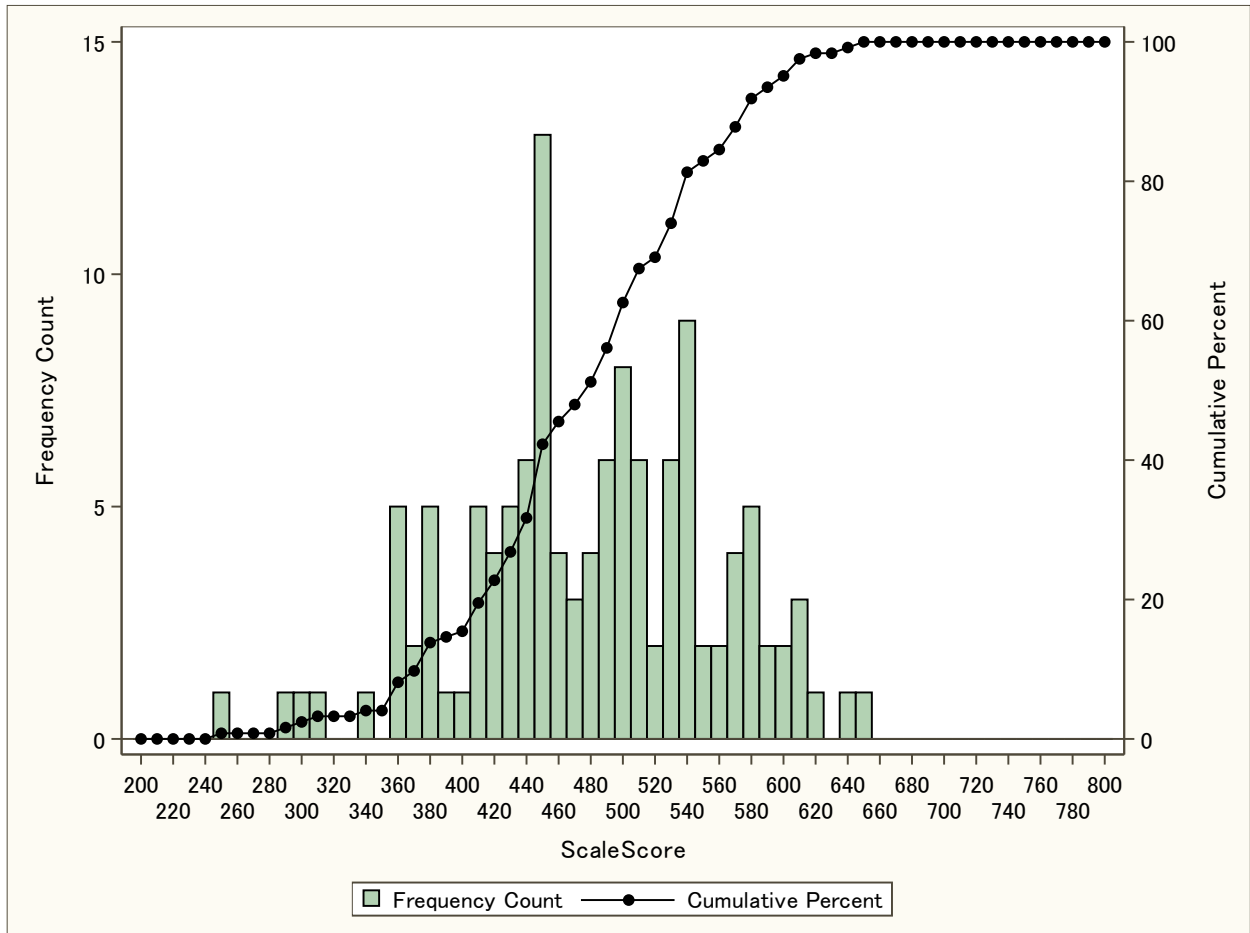
Frequency distribution for the ADAT Overall scale: 2018-2022
Oral Medicine
(98 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Orofacial Pain
(98 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Clinical Fellowship in Craniofacial and Special Care Orthodontics
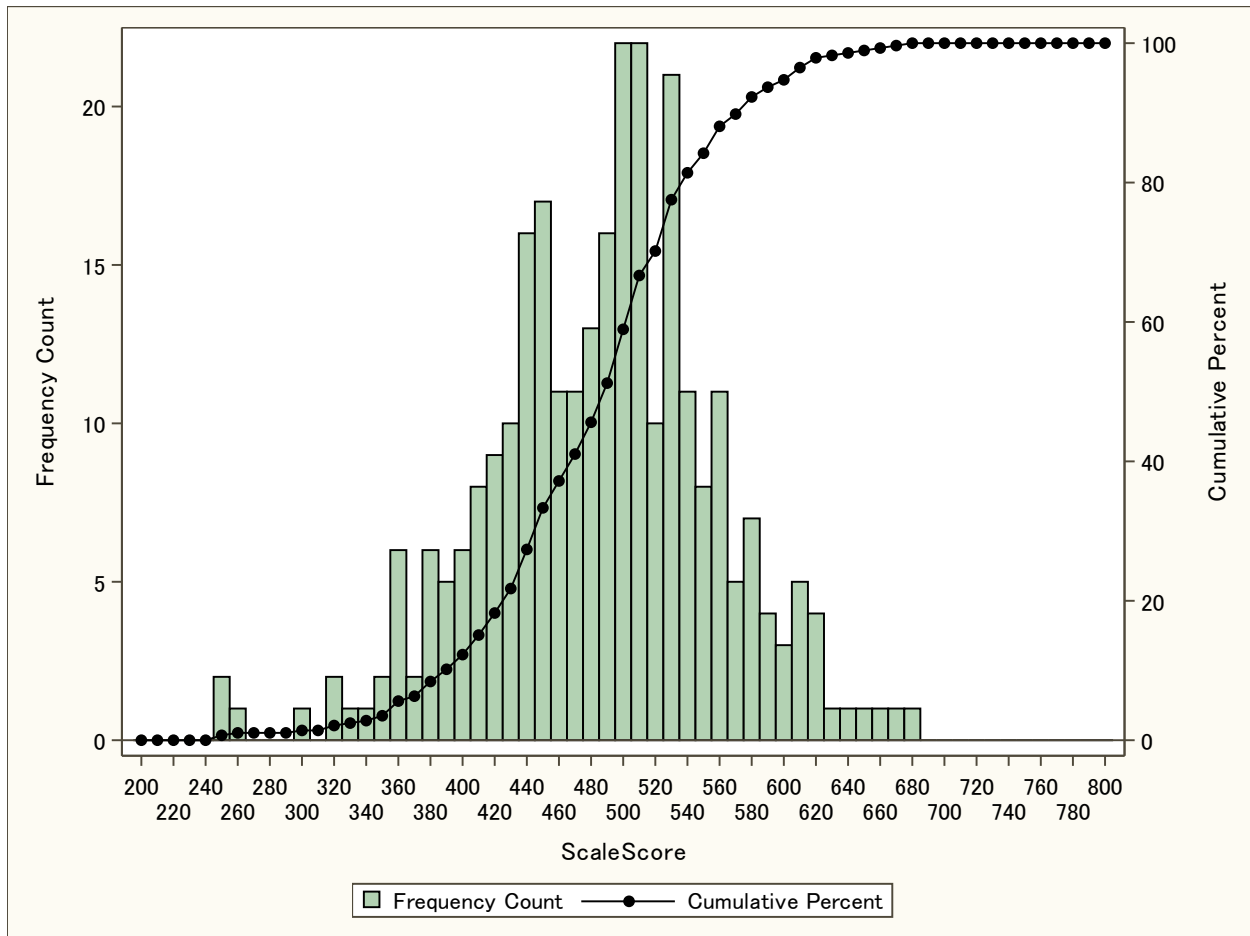(83 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
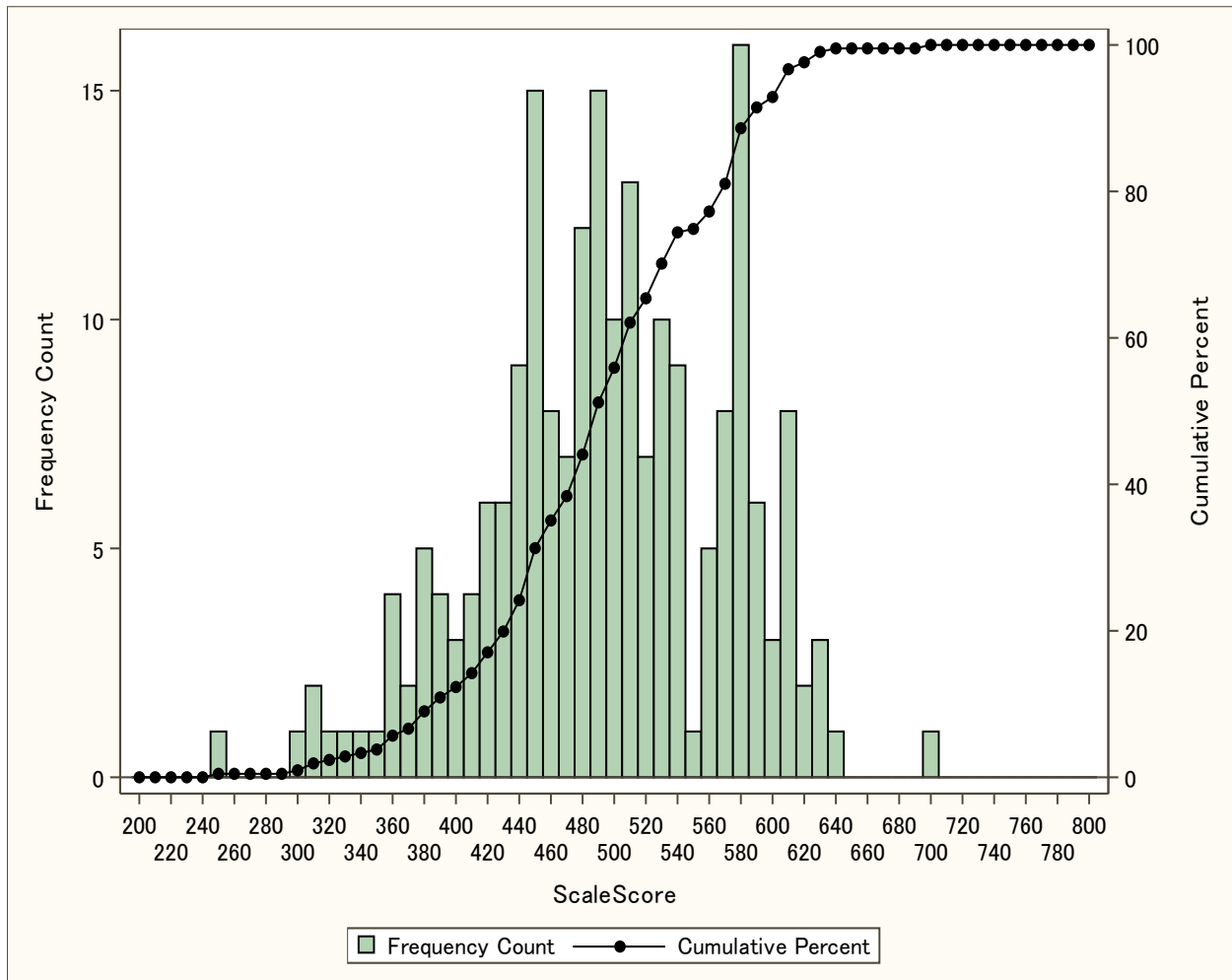Orthodontics and Dentofacial Orthopedics
(242 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Orthodontics/Periodontics
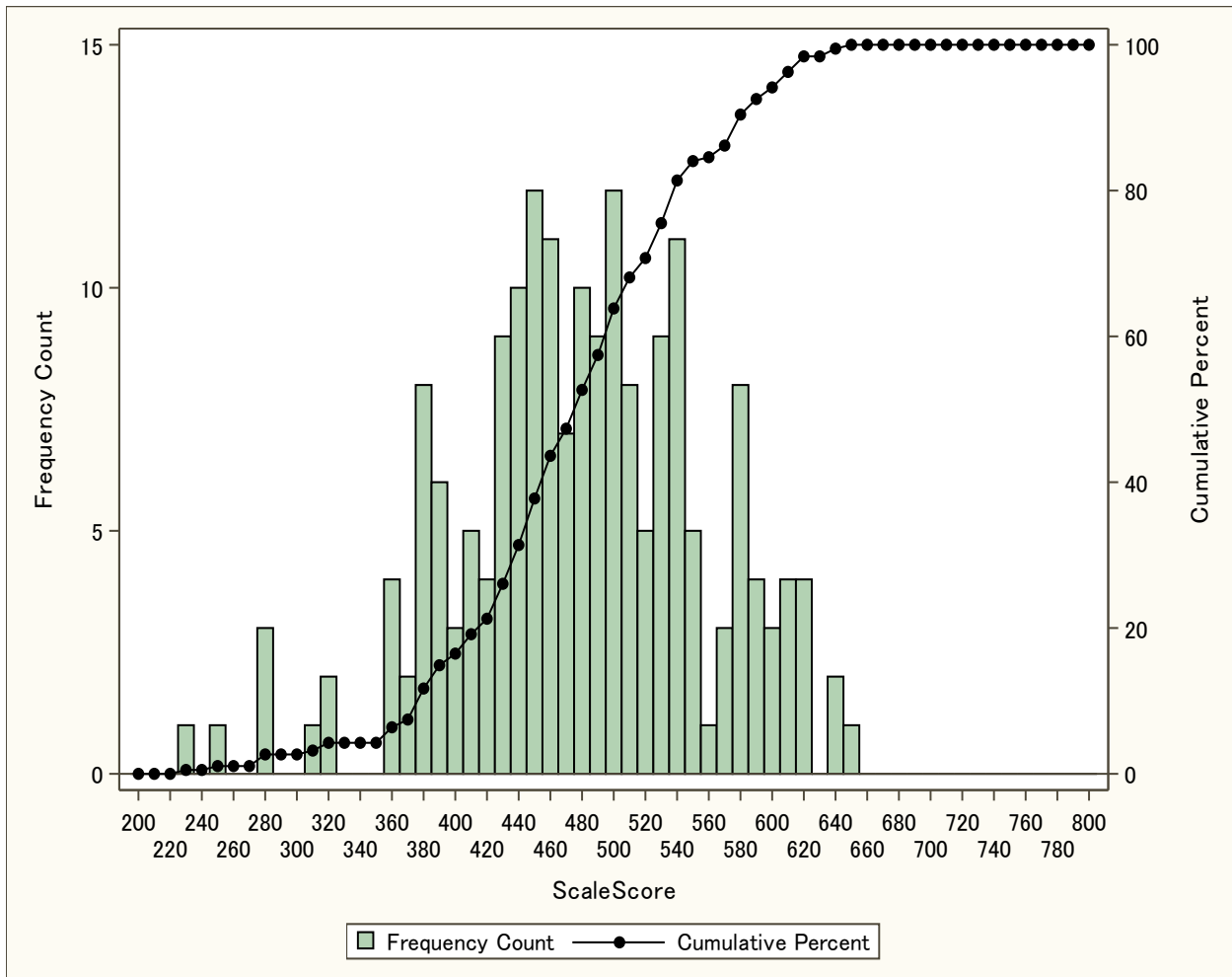(167 administrations)
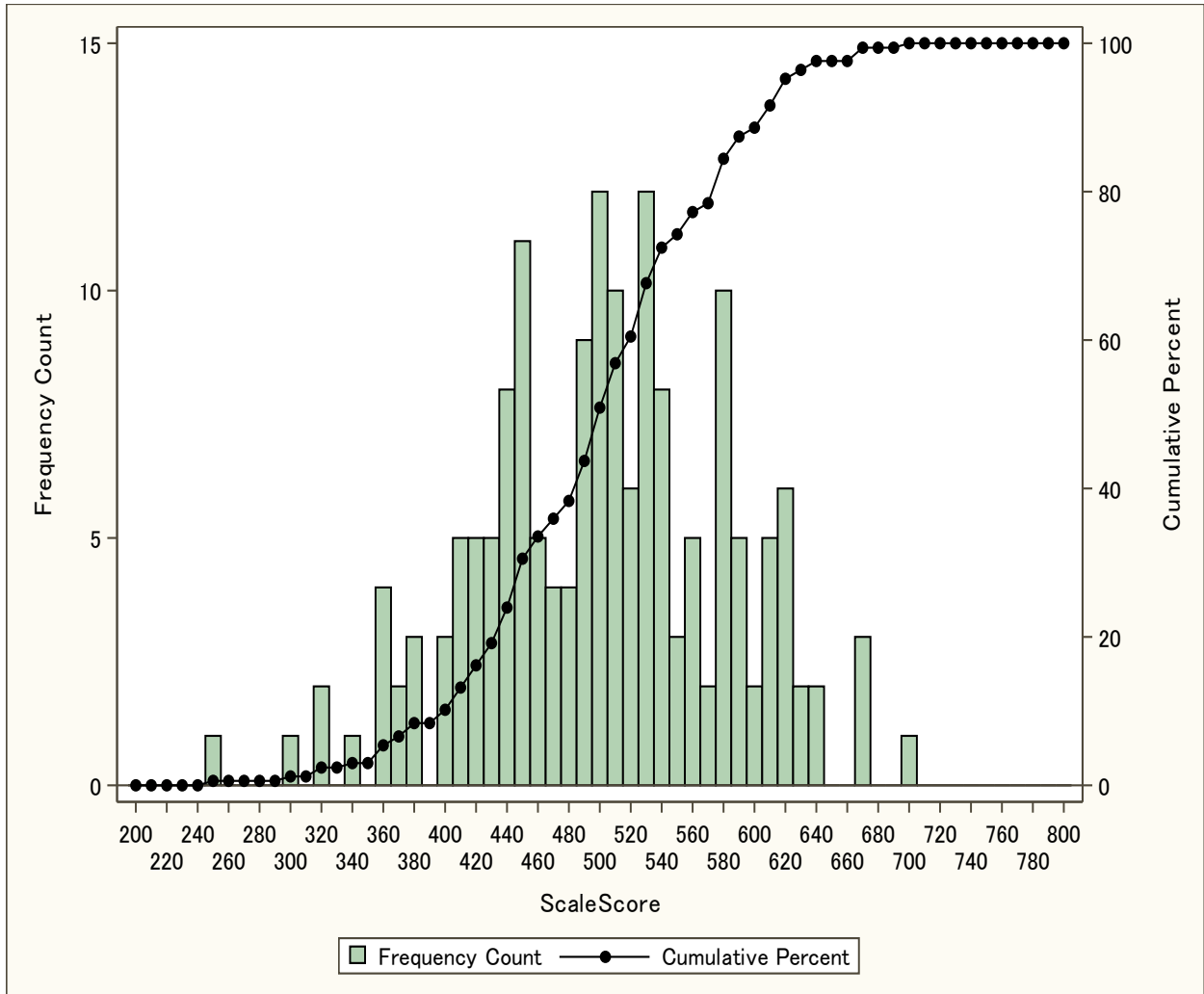
Frequency distribution for the ADAT Overall scale: 2018-2022
Pediatric Dentistry
(285 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Periodontics
(211 administrations)

Frequency distribution for the ADAT Overall scale: 2018-2022
Prosthodontics
(188 administrations)

Advanced Dental Admission Test Program

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September 2022