Quality of life after scoliosis surgery:

The Hospital Sultanah Bahiyah experience

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Dissertation Submitted in Partial Fulfillment of the Requirement for the Degree of Master of Medicine

(ORTHOPAEDICS)

UNIVERSITI SAINS MALAYSIA

2021

Quality of life after scoliosis surgery:

The Hospital Sultanah Bahiyah experience

FROM JANUARY 2016 TO DECEMBER 2020

STUDY VENUE:

HOSPITAL SULTANAH BAHIYAH,

ALOR SETAR, KEDAH.

ACKNOWLEDGEMENTS

The author would like to express deepest gratitude and thanks to the following individuals for their advice, guidance, comments and support during the preparation of this dissertation.

- Associate Professor Dr. Abdul Nawfar Bin Sadagatullah, supervisor of this study, lecturer of Orthopedics Department, HUSM for his guidance during the course of this study and completion of this paper.
- Associate Professor Dr Azriani Ab Rahman, lecturer Epidemiology & Biostatistics Department of Community Medicine, HUSM for her guidance in medical statistic and data analysis.
- Dato' Dr. Suresh Chopra, Head of Department of Orthopedics, Hospital Sultanah Bahiyah for his guidance in the completion of this paper.
- Dr. Zairul Anuar bin Kamarul Bahrin, Consultant spine surgeon of Hospital Sultanah Bahiyah for his guidance in the completion of this paper.
- Colleagues and all staff in the Orthopedics Department, HUSM.

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ABSTRAK

Pengenalan

Skoliosis idiopatik adalah kecacatan tiga dimensi kompleks ruang tulang belakang. Skoliosis idiopatik remaja (AIS) adalah jenis yang paling biasa yang mempengaruhi individu muda yang sihat. Kesejahteraan psikologi kumpulan pesakit muda ini menjadi perhatian semasa menguruskan pesakit ini. Tujuan kajian ini adalah untuk menilai kualiti hidup pesakit yang menjalani pembedahan pembetulan untuk AIS menggunakan soal selidik SRS-30.

Metodologi

Kajian keratan rentas terhadap semua pesakit yang menjalani pembedahan pembetulan kecacatan untuk AIS dari Januari 2016 hingga Disember 2019 di Hospital Sultanah Bahiyah telah dilakukan. Pesakit harus menjalani rawatan susulan sekurang-kurangnya 6 bulan selepas pembedahan. Hanya pesakit dengan skoliosis remaja idiopatik yang dimasukkan dalam kajian. Pengukuran radiograf sudut Cobb sebelum pembedahan dan lepas pembedahan diperoleh dari rekod perubatan pesakit. Pesakit kemudian dihubungi dan diberi borang soal selidik SRS - 30 untuk diisi.

Keputusan

24 pesakit direkrut dalam kajian ini berdasarkan kriteria kemasukan dan pengecualian. Sudut Cobb pra operasi rata-rata adalah 63.0 (19.90), sementara pasca operasi adalah 18.0 (11.25) dengan peratusan pembetulan 68.0 (17.5). Rata-rata jumlah skor SRS ialah 4.20 (0.38). Dengan menggunakan analisis korelasi Spearman's Rho terdapat hubungan yang signifikan dan positif antara kepuasan dengan skor domain pengurusan dan peratusan pembetulan Cobb's

Angle. Namun jumlah skor walaupun mempunyai korelasi positif, tidak signifikan secara statistik.

Kesimpulannya

Dalam kajian ini, jumlah skor SRS purata adalah 4.2 (0.38) menunjukkan satu hasil yang baik dari segi kualiti hidup dalam pembedahan pesakit menjalani scoliosis di Hospital Sultanah Bahiyah.

Kata Kunci:

Skoliosis Idiopatik Remaja, Kualiti Hidup, Kepuasan, SRS-30

ABSTRACT

Introduction

Idiopathic scoliosis is a is a complex three-dimensional deformity of the spinal column. Adolescent idiopathic scoliosis (AIS) is the most common type affecting healthy young individuals. Psychological well-being of these young group of patients has been area of concern when managing these patients. Aim of this study is to assess quality of life in patient undergoing corrective surgery for AIS using the SRS-30 questionaire.

Methodology

A cross sectional study of all patients that underwent deformity correction surgery for AIS from January 2016 till December 2019 in Hospital Sultanah Bahiyah was done. Patient had to be followed up for at least 6 months. Only patient with idiopathic adolescent scoliosis were included. Radiographic measurements of the cobb angle preoperative and postoperatively were obtained from medical records of the patient. Patients were then contacted and given the SRS-30 questionnaire to be filled up.

Results

24 patients were recruited in this study based on the inclusion and exclusion criteria . The median preoperative Cobb angle was 63.0 (19.90), while post operatively it was 18.0 (11.25) with a percentage of correction of 68.0 (17.5). The average total SRS score is 4.20(0.38). Using the Spearman's Rho correlation analysis there was a significance and moderately positive correlation between the satisfaction with management domain scores and the percentage of

Cobb's Angle correction. However, the total scores despite having a positive correlation, were not statisitcally significant.

Conclusion

In this study, the average total SRS score was 4.2(0.38) indicating a favourable outcome in terms of quality of life in patient undergoing scoliosis surgery in Hospital Sultanah Bahiyah.

Key Words:

Adolescent Idiopathic Scoliosis, Quality of life, Satisfaction, SRS-30

CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Idiopathic scoliosis is a complex three-dimensional deformity of the spinal column. Adolescent idiopathic scoliosis (AIS) is the most common type affecting healthy young individuals. The spine is affected in all three planes and diagnosis is confirmed on standing radiograph of the spine when the frontal curvature surpasses ≥ 10 degrees as measured according to the methods described by Cobb (Cobb angle). [1,2]

Commonly patients are diagnosed in the school setting by means of regular medical checkup and visits to school. They are then referred to the hospital for workup. As the term suggest it is disease of unknown cause and as such other causes must be ruled out namely, neuromuscular disease and congenital malformations. Smaller curves have little functional consequences and patients tend to lead a normal life as the deformity is barely noticeable. [3,4]

However, progression of the curves may result in several pronounced body deformities, uneven shoulders, and asymmetric waist line that subsequently leads to damaged body self-image and mental health, pain, spinal degenerative changes, several limitations in activities of daily living, and in severe cases disturbed pulmonary function. It affects them during the development of their psychological maturity and therefore may have a lasting effect. Patient's with idiopathic scoliosis have been shown to have a negative effect on quality of life. Larger curve deformities also appeared to be associated with poor lung function outcomes. [1,3,5]

Surgical reduction of deformity may be required to improve cosmesis and self-image while improving pulmonary function, relieving pain, and preventing curve progression. It is shown that scoliosis causes mental dysfunction and psychological problems in the patient and family not in accordance with the severity of the physical or radiological findings. The objective

success of surgery does not corelate with the subjective satisfaction of the patient because the perception of appearance differs from the surgeon. [2,6,7,8]

Current data shows no difference in quality of life in untreated and braced/surgically treated patients, but these data is limited to smaller curves. Surgery is reserved for patient with larger curves (>40 to 60). Therefore, both surgical and brace treatments for idiopathic scoliosis could be considered successful from a health-related quality-of-life point of view in adulthood. [3,6,7]

1.2 OBJECTIVE

General Objective:

To assess the patient quality of life after surgical correction of scoliosis in our population

Specific Objective:

1. Assess patient's quality of life and mental health after surgical correction of scoliosis at least 6 months post op.
2. Determine correlation between quality of life and improvement in radiographic changes (Cobb angle measurement pre and post op)

CHAPTER 2: STUDY PROTOCOL

2.1 DISSERTATION PROTOCOL

DISSERTATION PROPOSAL

TITLE:

Quality of life after scoliosis surgery:

The Hospital Sultanah Bahiyah experience

NAME: DR KISHANRAJ A/L KARTHIKESAN

MATRIK NO: P-UM0233/17

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Introduction

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Surgical reduction of deformity may be required to improve cosmesis and self-image while improving pulmonary function, relieving pain, and preventing curve progression. It is shown that scoliosis causes mental dysfunction and psychological problems in the patient and family not in accordance with the severity of the physical or radiological findings. The objective

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Current data shows no difference in quality of life in untreated and braced/surgically treated patients, but these data is limited to smaller curves. Surgery is reserved for patient with larger curves (>40 to 60). Therefore, both surgical and brace treatments for idiopathic scoliosis could be considered successful from a health-related quality-of-life point of view in adulthood. [3,6,7]

Rationale of study

Adolescent idiopathic scoliosis is becoming an increasingly prevalent disease (2-2.5% population). It is most likely due to the improving screening at the school level as well as increased awareness among the public.

Impact of the disease on mental health in our population is not well documented. The difference in socioeconomic status as well as social background may have an impact on how patients as well as the family perceive the disease process.

Literature review

Recently, there is a trend toward evaluating subjective outcomes and quality of life reported by patients. As this disease affects young individuals there are not many papers on long term outcomes in terms of health-related quality of life in patients. New questionnaires are being developed by Scoliosis Research Society (SRS) to comprehensively assess the mental health and quality of life of patients after surgical correction.

Aina J. Danielsson et al in 2001, published a paper where a consecutive series of patients with adolescent idiopathic scoliosis treated with brace or surgery between 1968 and 1977, were followed up for at least 20 years after completion of treatment and assessed with quality of life questionnaires. Results were matched with a control group of same sex and age group. It was found that psychological well-being in AIS patients were quite good when compared to the general population. Even the physical function is equal except in a minority of patients. However, they did display a lower cosmetic well-being compared to the general population.

Hasan Ghandehari et al in 2015, evaluated patient outcome and satisfaction after surgical correction of AIS, by enrolling 135 patients undergoing surgery into their study and obtained pre and postoperative x-rays. The patiens were followed up for 2 years and at the end of treatment competed SRS-30 questionnaires to assess patient satisfaction. He reported that greater radiographic angle corrected correlated with higher SRS-30 scores (patient satisfaction). Cosmesis was the most important factor affecting patient satisfaction.

Weiss et al, in 2016, conducted a review in available literature on long term follow up in adolescent idiopathic scoliosis. They mentioned that AIS is a relatively benign condition and surgery carries risk and long-term consequences. Low back pain and potential disc degeneration increases over time after spinal fusion. At present, no high-quality evidence is available to support claim that surgery may improve symptoms in AIS except in severe cases.

Hisam et al, in 2015, conducted a study correlation between patient satisfaction and radiographic parameters. They concluded that patient satisfaction was high post operatively except for lower scores in self-image domain of the questionnaire and there was no correlation between radiographic parameters and satisfaction, despite attempts at greater curvature reduction. Similar findings were reported by Ida et al. who reviewed retrospectively patients who underwent surgery for AIS and followed up for minimum of 20 years.

Ameri et al, in 2008, studied 40 adolescents with AIS preoperatively by physical and psychological measurements. Of those undergoing surgical correction for severe curves. 50% reported satisfaction. Preoperative physical characteristics, psychological difficulties, and unrealistic expectations regarding postoperative cosmesis are associated with patient neutrality or dissatisfaction.

Elias Diarbakerli et al (2018), evaluated quality of life in adulthood for treated and untreated individuals with AIS. 1187 patients were included and answered health related quality of life questionnaires. He reported that untreated adults with idiopathic scoliosis had similar health-related quality of life to previously brace-treated individuals, and they had marginally

higher health-related quality of life compared with surgically treated individuals. Therefore, both surgical and brace treatments for idiopathic scoliosis could be considered successful from a health-related quality-of-life point of view in adulthood.

OBJECTIVE

General Objective:

To assess the patient quality of life after surgical correction of scoliosis in our population

Specific Objective:

1. Assess patient's quality of life and mental health after surgical correction of scoliosis at least 6 months post op.
2. Determine correlation between quality of life and improvement in radiographic changes (cobb angle measurement pre and post op)

Study Design

This would be a cross sectional study where data is collected from the study population by means of a questionnaire.

Researchers involved will adhere to the principles of the Declaration of Helsinki and the Malaysian Good Clinical Practice Guidelines.

This study is self-sponsored.

Study Area

My study will be conducted solely in Hospital Sultanah Bahiyah, which started operations in its new modern building since July 2007. It is a tertiary referral center with a Spine unit in Kedah and accepts referral from the northern region.

Study Population

My reference population would be individuals who underwent deformity corrective surgery for adolescent idiopathic scoliosis between 2016 to 2019.

Selection criteria

A. Inclusion criteria

1. patients who underwent deformity correction surgery for scoliosis
2. The surgical procedure done between 2016 and 2019 in HSB
3. Both genders
4. All ethnic groups
5. At least 6 months post op

B. Exclusion criteria

1. Patients who had multiple surgery
2. Other causes of scoliosis
3. Patients who are not able to answers the questionnaire, with or without mental illness or slow learner

Sample size estimation

Sample size estimation of a descriptive study of a continuous variable:

Confidence interval (CI): 95%

Width of confidence(W): 5

Standar deviation of the variable (S): 6

W/S = 0.83

Standard normal deviate for $\alpha = Z\alpha = 1.96$

Sample size = $N = 4Z\alpha^2S^2/W^2 = 22$

Sampling Method

List of patients in Hospital Sultanah Bahiyah will be obtained from operative census. Patient will be selected based on inclusion and exclusion criteria. Permission to access patient record will be obtained from the medical records department.

Research tool

1. SRS-30 questionnaire provided by the Scoliosis Research Society
2. Radiographic images are measured for Cobb angle using the measurement tool of the workstation by GE Healthcare by a single person (Kishanraj) for all the parameters and documented in degree of angle.

Scoliosis Patient Questionnaire: **Modified 11/12/03**
Version 30 (Encompasses Versions 22 and 24)

Study ID :_____ **Age:**_____ **Date:**_____

Medical Record #_____ **SS:**_____

Exam: Pre-treatment 3 mos. 6 mos. 1 year _____ years

Your doctors are carefully evaluating the condition of your back before and after your treatment. Please circle the one best answer to each question unless otherwise indicated. If you already have had surgery, please complete sections 1 and 2. Otherwise, just complete section 1.

All results will be kept confidential.

Section 1: All patients

1. **Which one of the following best describes the amount of pain you have experienced during the past 6 months?**
   - ☐ None ☐ Moderate to severe
   - ☐ Mild ☐ Severe
   - ☐ Moderate

2. **Which one of the following best describes the amount of pain you have experienced over the last month?**
   - ☐ None ☐ Moderate to severe
   - ☐ Mild ☐ Severe
   - ☐ Moderate

3. **During the past 6 months have you been a very nervous person?**
   - ☐ None of the time ☐ Most of the time
   - ☐ A little of the time ☐ All of the time
   - ☐ Some of the time

4. **If you had to spend the rest of your life with your back shape as it is right now, how would you feel about it?**
   - ☐ Very happy ☐ Somewhat unhappy
   - ☐ Somewhat happy ☐ Very unhappy
   - ☐ Neither happy nor unhappy

5. **What is your current level of activity?**
   - ☐ Bedridden/wheelchair
   - ☐ Primarily no activity
   - ☐ Light labor, such as household chores
   - ☐ Moderate manual labor and moderate sports, such as walking and biking
   - ☐ Full activities without restriction

6. **How do you look in clothes?**
   - ☐ Very good
   - ☐ Good
   - ☐ Fair
   - ☐ Bad
   - ☐ Very bad

7. **In the past 6 months have you felt so down in the dumps that nothing could cheer you up?**
   - ☐ Very often ☐ Rarely
   - ☐ Often ☐ Never
   - ☐ Sometimes

8. **Do you experience back pain when at rest?**
   - ☐ Very often ☐ Rarely
   - ☐ Often ☐ Never
   - ☐ Sometimes

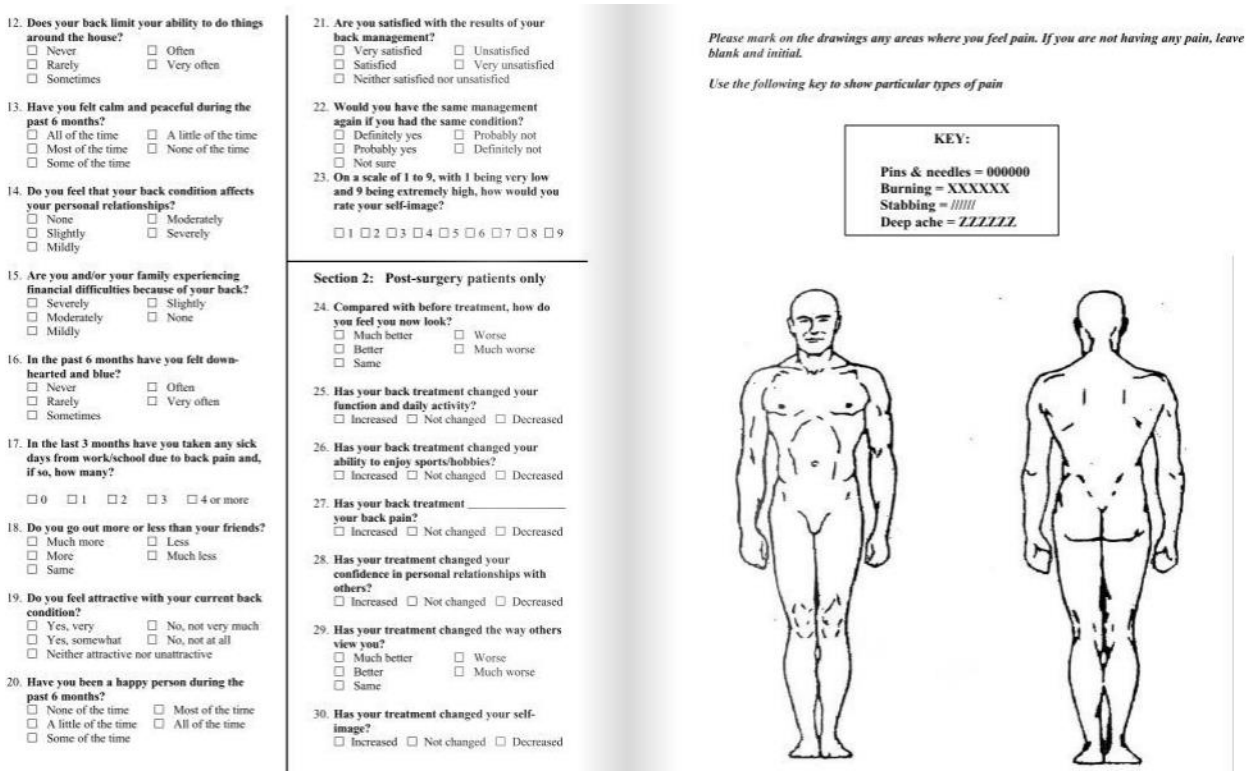
9. **What is your current level of work/school activity?**
   - ☐ 100% normal ☐ 25% normal
   - ☐ 75% normal ☐ 0% normal
   - ☐ 50% normal

10. **Which of the following best describes the appearance of your trunk; defined as the human body except for the head and extremities?**
    - ☐ Very good ☐ Poor
    - ☐ Good ☐ Very poor
    - ☐ Fair

11. **Which one of the following best describes your medication usage for your back?**
    - ☐ None
    - ☐ Non-narcotics weekly or less (e.g., Tylenol, Ibuprofen)
    - ☐ Non-narcotics daily
    - ☐ Narcotics weekly or less (e.g., Percocet, Lorcet, Codeine, Darvocet)
    - ☐ Narcotics daily
    - ☐ Other (please specify below)

    Medication:
    _____
    Usage (weekly or less or daily):
    _____

Figure 1: SRS 30 questionnaire



12. **Does your back limit your ability to do things around the house?**
☐ Never ☐ Often
☐ Rarely ☐ Very often
☐ Sometimes

13. **Have you felt calm and peaceful during the past 6 months?**
☐ All of the time ☐ A little of the time
☐ Most of the time ☐ None of the time
☐ Some of the time

14. **Do you feel that your back condition affects your personal relationships?**
☐ None ☐ Moderately
☐ Slightly ☐ Severely
☐ Mildly

15. **Are you and/or your family experiencing financial difficulties because of your back?**
☐ Severely ☐ Slightly
☐ Moderately ☐ None
☐ Mildly

16. **In the past 6 months have you felt down-hearted and blue?**
☐ Never ☐ Often
☐ Rarely ☐ Very often
☐ Sometimes

17. **In the last 3 months have you taken any sick days from work/school due to back pain and, if so, how many?**
☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

18. **Do you go out more or less than your friends?**
☐ Much more ☐ Less
☐ More ☐ Much less
☐ Same

19. **Do you feel attractive with your current back condition?**
☐ Yes, very ☐ No, not very much
☐ Yes, somewhat ☐ No, not at all
☐ Neither attractive nor unattractive

20. **Have you been a happy person during the past 6 months?**
☐ None of the time ☐ Most of the time
☐ A little of the time ☐ All of the time
☐ Some of the time

21. **Are you satisfied with the results of your back management?**
☐ Very satisfied ☐ Unsatisfied
☐ Satisfied ☐ Very unsatisfied
☐ Neither satisfied nor unsatisfied

22. **Would you have the same management again if you had the same condition?**
☐ Definitely yes ☐ Probably not
☐ Probably yes ☐ Definitely not
☐ Not sure

23. **On a scale of 1 to 9, with 1 being very low and 9 being extremely high, how would you rate your self-image?**
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Section 2: Post-surgery patients only

24. **Compared with before treatment, how do you feel you now look?**
☐ Much better ☐ Worse
☐ Better ☐ Much worse
☐ Same

25. **Has your back treatment changed your function and daily activity?**
☐ Increased ☐ Not changed ☐ Decreased

26. **Has your back treatment changed your ability to enjoy sports/hobbies?**
☐ Increased ☐ Not changed ☐ Decreased

27. **Has your back treatment _____ your back pain?**
☐ Increased ☐ Not changed ☐ Decreased

28. **Has your treatment changed your confidence in personal relationships with others?**
☐ Increased ☐ Not changed ☐ Decreased

29. **Has your treatment changed the way others view you?**
☐ Much better ☐ Worse
☐ Better ☐ Much worse
☐ Same

30. **Has your treatment changed your self-image?**
☐ Increased ☐ Not changed ☐ Decreased

Please mark on the drawings any areas where you feel pain. If you are not having any pain, leave blank and initial.

Use the following key to show particular types of pain

KEY:

Pins & needles = 000000
Burning = XXXXXX
Stabbing = //////
Deep ache = ZZZZZZ

Figure 2: SRS-30 questionnaire (cont.)

Data collection method

Screening of patients will be done according to selection criteria. Retrospective review of case notes, operative notes and digital records (Picture Archiving and Communications System - PACS) will be done. Patients will be then contacted for an appointment. Duration of participation of the subjects will be one day (when the appointment is made). Written consent is obtained from patients above the age of 18, otherwise parents acknowledgement is required. Consented patients will be given the questionnaire to be filled up and assessed by the primary investigator.

The survey tool is the SRS questionnaire provided by the Scoliosis Research Society, which is validated internationally. For the protection of patient's privacy, the names of patients and patient registration number will be omitted from the questionnaire and a study ID will be used instead. The questionnaire is in English with simple vocabulary used for the basic understanding of the participant. It will be conducted by the principal investigator solely to ensure consistent explanation and clarification of any queries the participant may have regarding the questionnaire. Presence of an impartial witness, ideally a medical personnel e.g staff nurse, during the interview will also aid in protecting the privacy as well as mental state of the patient.

Study data will be stored for a duration of 2 years for perusal and disposed off thereafter. Patient private information such as names and contact information will remain confidential and will not be revealed in case of publication. Data published will comprise of purely patient satisfaction rates and will not single out any individual that has participated in the study.

The study will take a duration of 5 months, proposal drafting for 1 month, 2 months for data collection and data analysis and write-up for another 2 months.

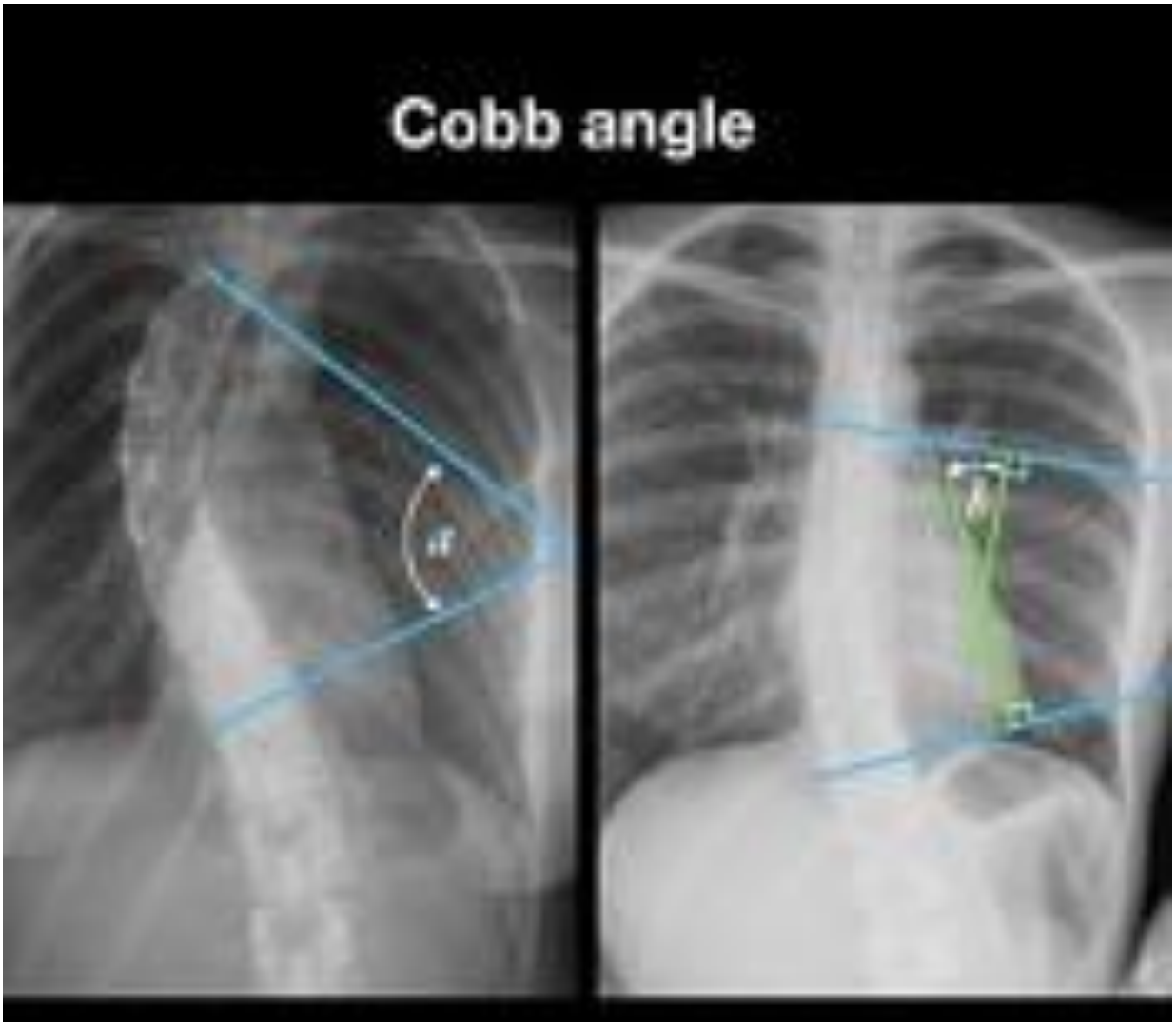
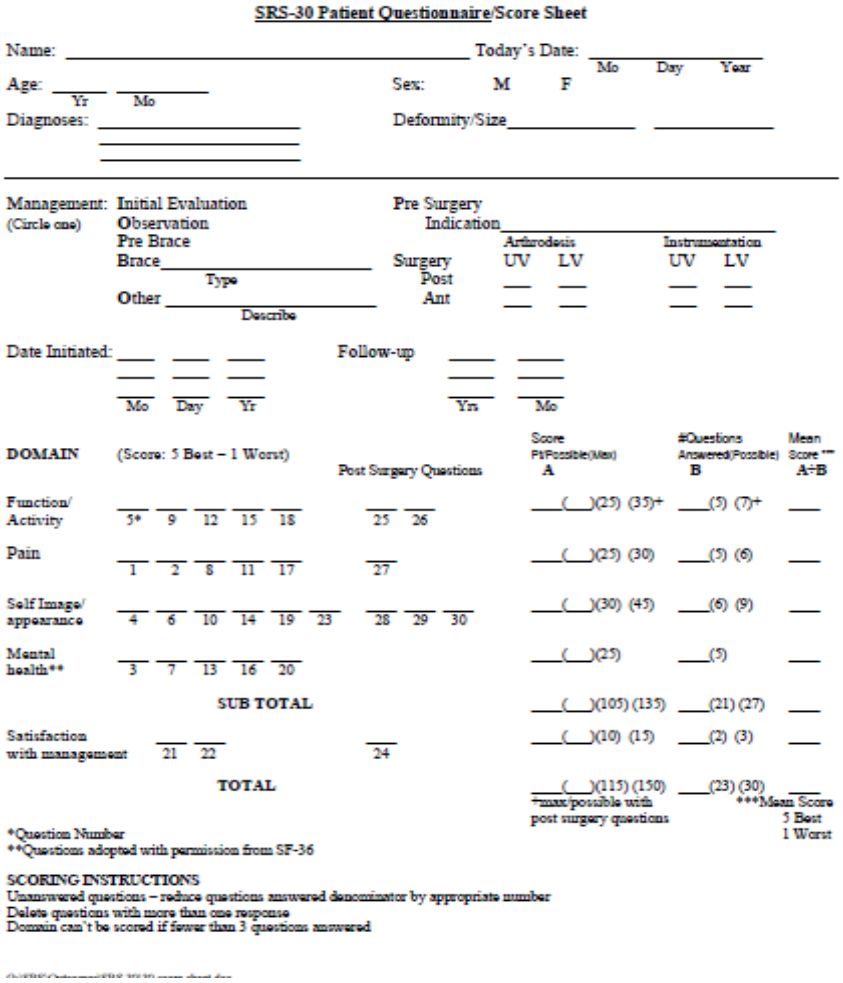


Figure 3: Cobb angle measurement from radiographic images



SRS-30 Patient Questionnaire/Score Sheet

Name: _____ Today's Date: _____ (Mo Day Year)

Age: _____ Yr _____ Mo Sex: M F

Diagnoses: _____

Deformity/Size _____ _____

Management: (Circle one) Initial Evaluation; Observation; Pre Brace; Brace _____ (Type); Other _____ (Describe)

Pre Surgery Indication _____

Surgery	Arthrodesis UV	Arthrodesis LV	Instrumentation UV	Instrumentation LV
Post	___	___	___	___
Ant	___	___	___	___

Date Initiated: ___ ___ ___ (Mo Day Yr)

Follow-up ___ ___ (Yrs Mo)

DOMAIN	(Score: 5 Best – 1 Worst)	Post Surgery Questions	Score Pt/Possible(Max) A	#Questions Answered/Possible B	Mean Score *** A÷B
Function/ Activity	___ ___ ___ ___ ___ 5* 9 12 15 18	___ ___ 25 26	___(___)(25) (35)+	___(5) (7)+	___
Pain	___ ___ ___ ___ ___ 1 2 8 11 17	___ 27	___(___)(25) (30)	___(5) (6)	___
Self Image/ appearance	___ ___ ___ ___ ___ ___ 4 6 10 14 19 23	___ ___ ___ 28 29 30	___(___)(30) (45)	___(6) (9)	___
Mental health**	___ ___ ___ ___ ___ 3 7 13 16 20		___(___)(25)	___(5)	___
SUB TOTAL			___(___)(105) (135)	___(21) (27)	___
Satisfaction with management	___ ___ 21 22	___ 24	___(___)(10) (15)	___(2) (3)	___
TOTAL			___(___)(115) (150) +max possible with post surgery questions	___(23) (30)	___ ***Mean Score 5 Best 1 Worst

*Question Number
**Questions adopted with permission from SF-36

SCORING INSTRUCTIONS
Unanswered questions – reduce questions answered denominator by appropriate number
Delete questions with more than one response
Domain can't be scored if fewer than 3 questions answered

Figure 4: SRS-30 questionnaire scoresheet

No:	
Age:	
Sex:	
Operation date:	
Pre-op Cobb angle:	
Post op Cobb angle	

Figure 5: Data collection sheet for pre- and post-operative cobb angle

Data Analysis

Statistical analysis will be conducted using IBM SPSS software version 24 to determine mean and standard deviation of all parameters using descriptive statistic

Objective

1. Estimation of single mean and standard deviation → descriptive analysis

2. Hypothesis testing: Spearman's/Pearson's correlation test

Benefit of study

This study provides better understanding of socioeconomic implication of the disease on patients. It also provides data for future studies. It may also influence decision making surgeons in treating future patients.

Ethical consideration

It is a low risk study with retrospective data collection and meeting patients only once for questionnaire. Patients who do not wish to participate will not be treated differently. Privacy of patient will be protected, and data collected will not identify the responders. There is no conflict of interest in my study.

Any participant who may have been inflicted with psychological disturbance either directly or indirectly, by this study or the disease process itself can be identified during the interview process. These patients will then be referred to a counsellor as deemed necessary.

The participants will not be offered any incentives to participate nor will they be coerced into it. The study itself aids in identifying issues the patient may be facing and aid in the management of the patient itself if necessary. Compensation therefore is not considered. There will also not be honorarium for patients participating.