

Patient-Reported Outcomes in Esophageal Atresia- *The holistic view for a holistic care*

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Patient-Reported Outcomes?

**LOOK INTO THEIR VIEW-
OUTCOMES THAT MATTER TO THE PATIENTS**



Patient-centered
care and treatment



Patient-Reported Outcomes?

Any report of the status of a patient's "Health" condition that comes directly from the patient

US Food and Drug Administration, 2009

"Health"- holistic

...a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity



**“Health”-
related
quality of life
(HRQoL)**
*- perceived
impact of disease
and treatment on
the physical,
psychological and
social functioning
and well-being*

DISEASE-SPECIFIC

Sensitive to issues important for a specific population and clinical context

SYMPTOM-SPECIFIC

Measures outcomes that are in common in several patient groups
Enables comparison between patient groups

GENERIC

Measures aspects independent of health status
Enables comparison between the general population and patient groups

The holistic view

1. Is HRQoL impaired in children with repair of EA compared to healthy/general norms?

2. Is HRQoL impaired in adults with repair of EA compared to healthy/general norms?

3. What aspects in life form part of HRQoL specific for patients with repair of EA?

4. Is there a profile of affected areas in life among patients with repair of EA?

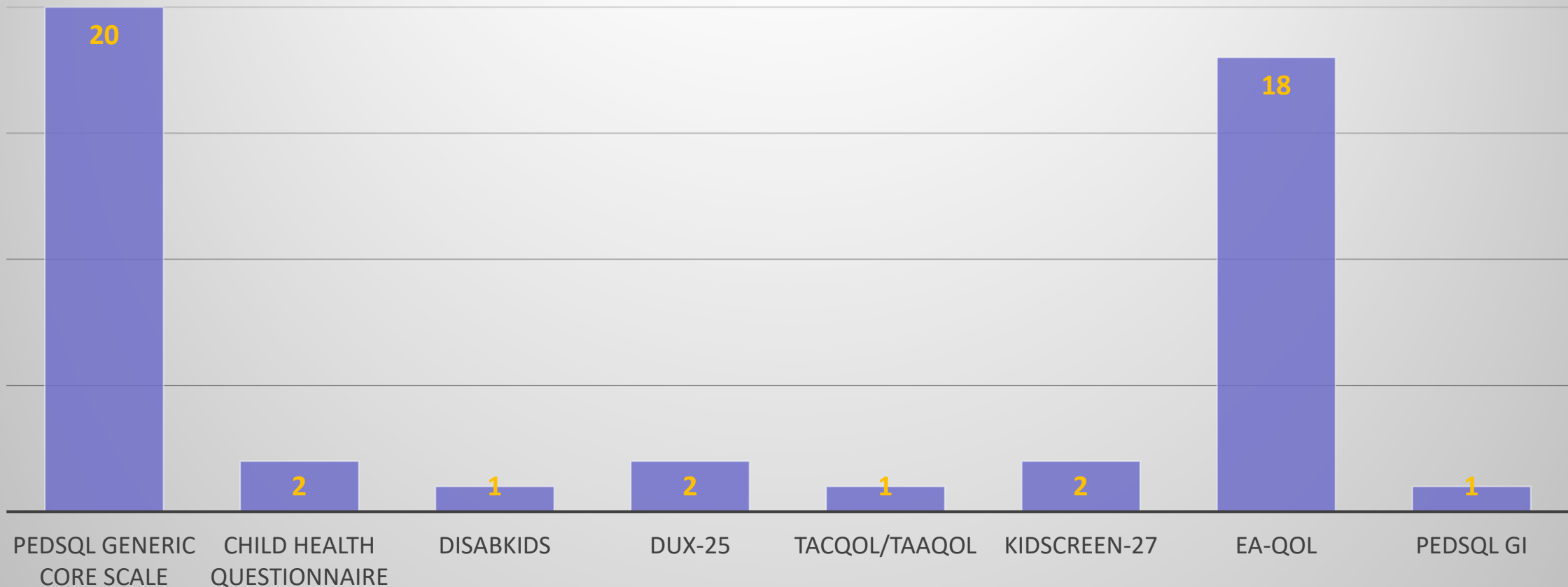
Take home message?

1. Is HRQoL impaired in children with repair of EA compared to healthy/general norms?

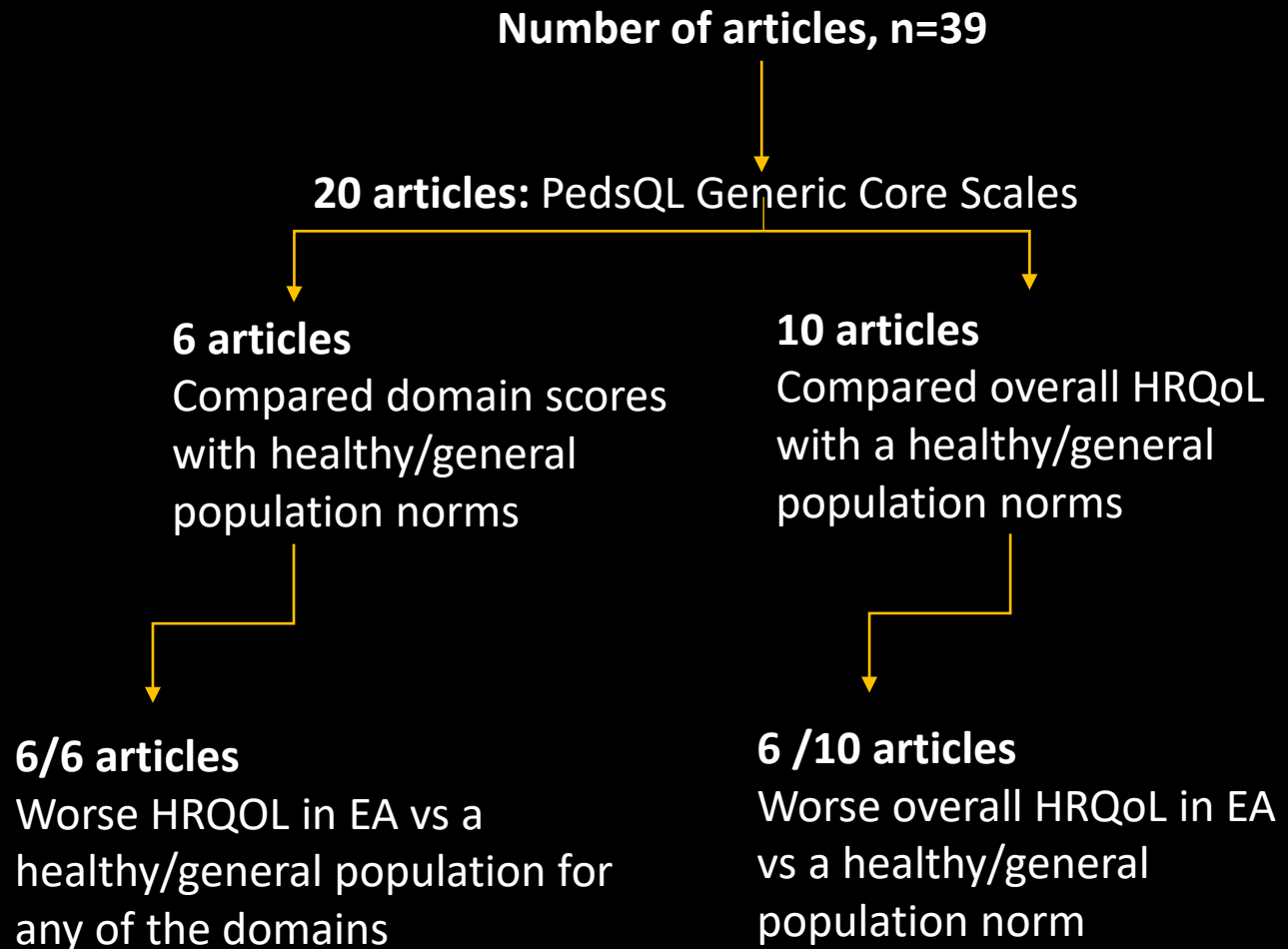
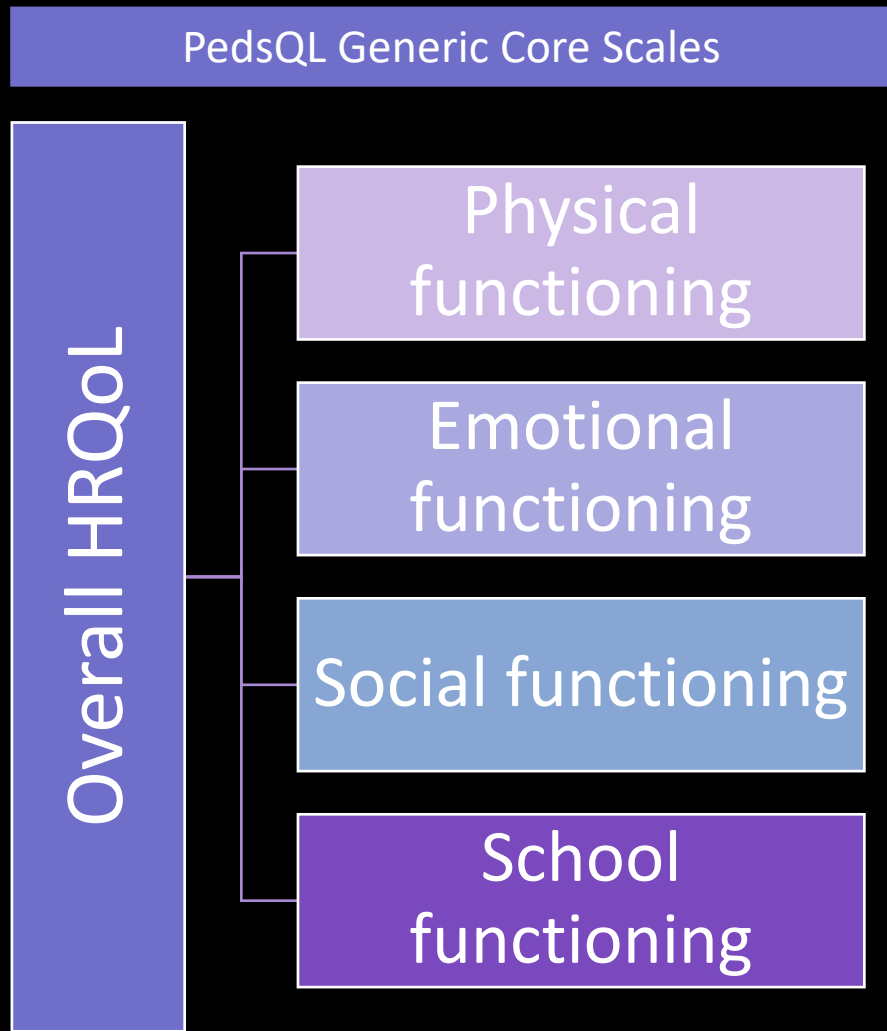
Let's take a closer look at these findings

Number of articles, n=39

Questionnaires used in HRQoL studies in children with repair of EA



Generic HRQoL Questionnaires



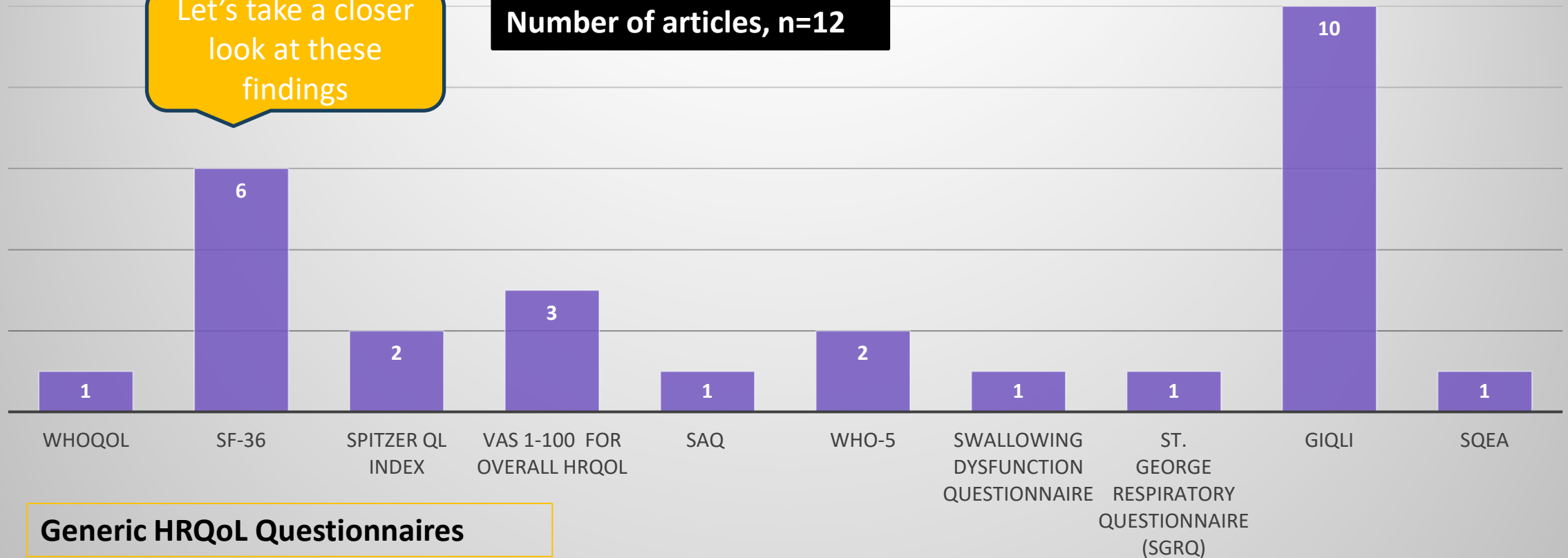
**Children with repair of EA may have impaired HRQoL compared to general/healthy norms in parent-reports
However, Sparsely investigated field**

2. Is HRQoL impaired in adults with repair of EA compared to healthy/general norms?

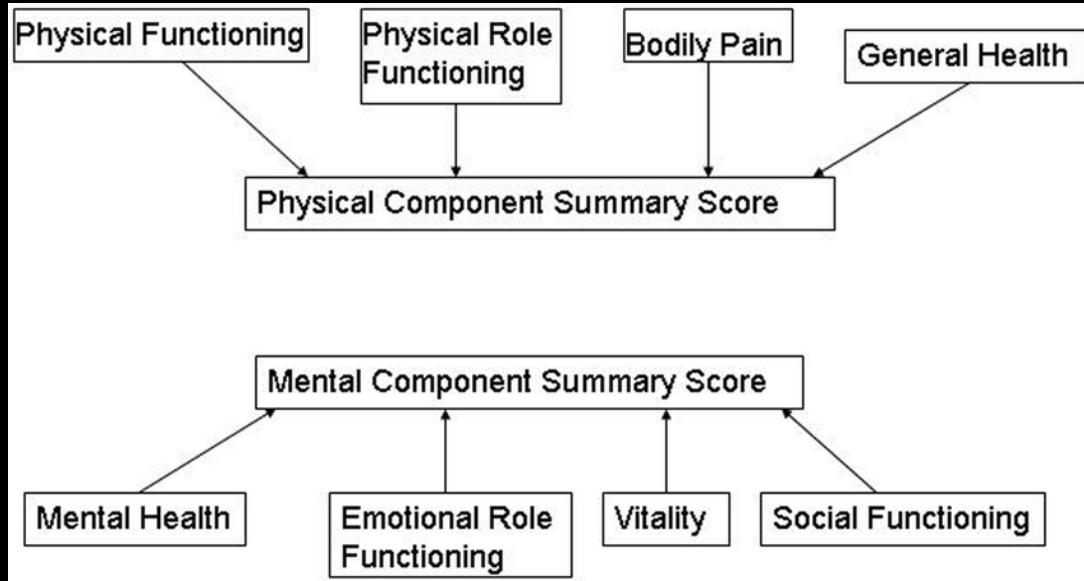
Questionnaires used in HRQoL studies in adults with repair of EA

Let's take a closer look at these findings

Number of articles, n=12



SF-36



Number of articles, n=12

6 articles: SF-36

2 articles

Compared subscale scores with healthy/general population norms

1/2 articles

Worse HRQoL in EA vs a healthy/general population in any of the domains

5 articles

Compared Component Summary scores with a healthy/general population norms

0/5 articles

Worse HRQoL in EA vs a healthy/general population

No support for impaired HRQoL in adults with repair of EA compared to general/healthy norms using SF-36

However,

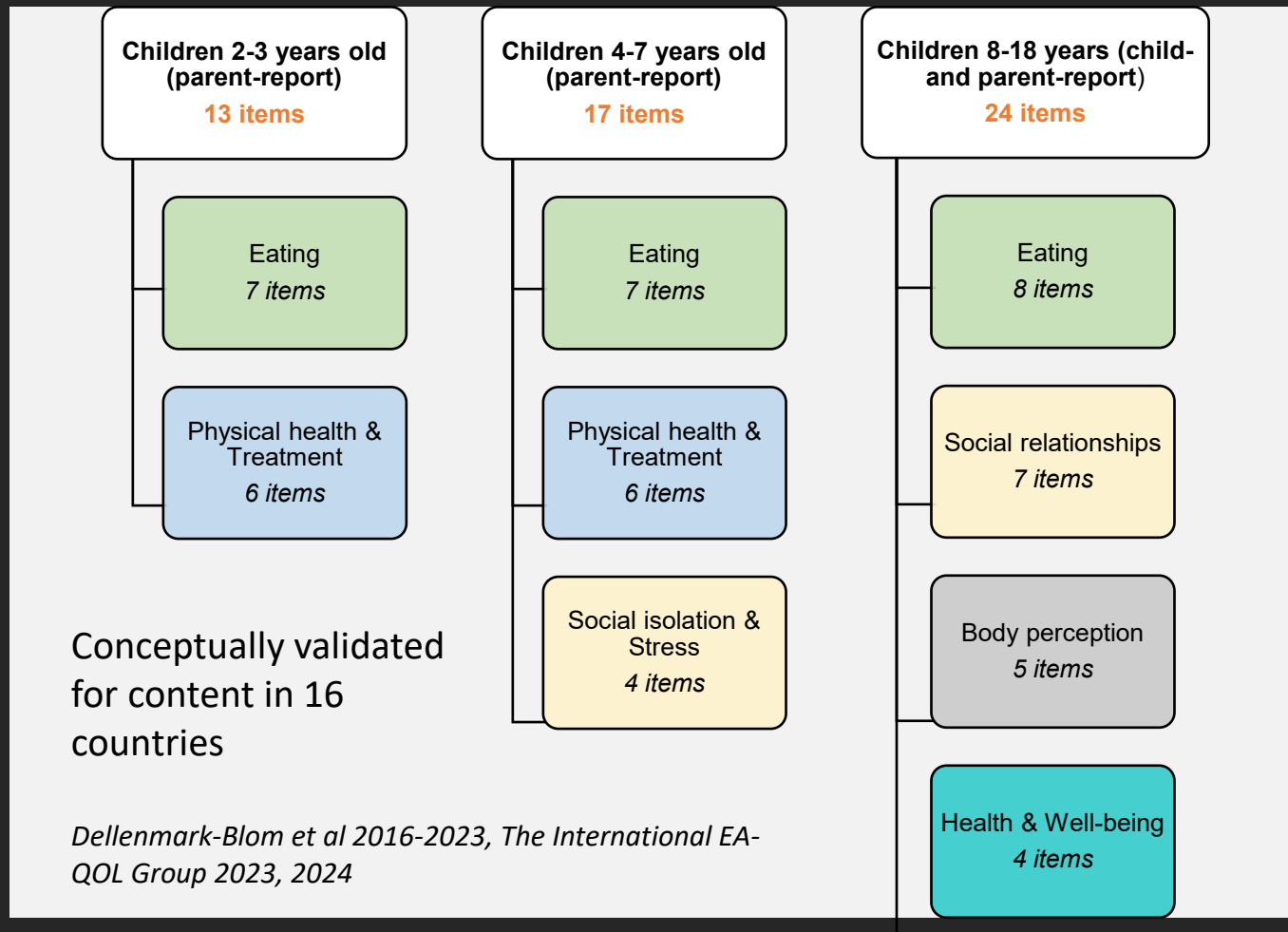
Sparingly investigated field

70% of the studies 10-30 years old

Limited geographic spread

3. What aspects in life form part of HRQoL specific for patients with repair of EA?

EA-QOL (children and adolescents)

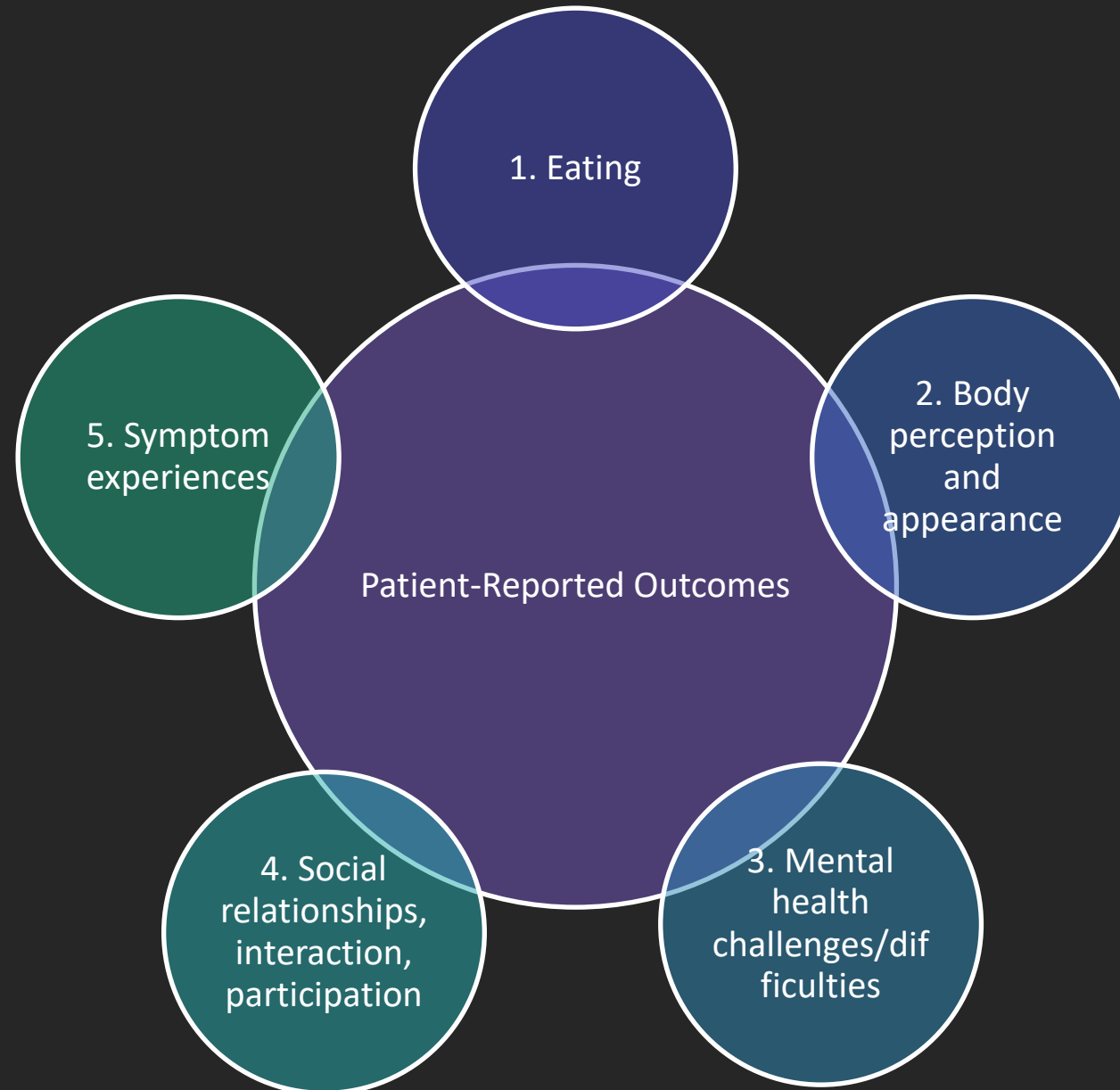


SQEA (adults)

- Eating and drinking
- Esophageal complaints
- Respiratory complaints
- Physical performance in general
- Medication
- Relationships
- Appearance
- Fears and worries
- Complaints of the stomach and/or intestines
- Daytime activities
- Recollections of past events

Ten Kate et al 2022

4. Is there a profile of affected areas in life among patients with repair of EA?



4. Is there a profile of affected areas in life among patients with repair of EA?

*Eating was described to be impacted in the patients' everyday life
-physical, emotional and social experiences*

Children

“Sometimes I get lonely during lunch break in school because my friends eat much faster than I do”

Dellenmark-Blom et al 2016

Adults

“choking and gurgling in public is horrifying for me and everyone watching”

Ten Kate et al 2021, Rabone & Wallace 2021

5. Is there a profile of affected areas in life among patients with repair of EA?

Original Article

Clinical Factors Affecting Condition-Specific Quality-of-Life Domains in Pediatric Patients after Repair of Esophageal Atresia: The Swedish-German EA-QOL Study

Michaela Dellenmark-Blom^{1,2} Julia Quitmann³ Jens Dingemann⁴ Stefanie Witt³ Benno M. Ure⁴
Monika Bullinger³ Linus Jönsson² Vladimir Gatzinsky² Carmen Dingemann⁴

Who has poorer QOL in relation to “Eating”?

- Child ages 2 to 7 years; gastrostomy insertion ($p < 0.0001$, $R^2 = 0.25$)
- Child ages 8 to 17 years; No primary anastomosis ($p = 0.005$, $R^2 = 0.13$ child-report); Prematurity ($p = 0.019$) & esophageal dilatation ($p = 0.002$, $R^2 = 0.24$, parent-report)
- Both age groups: Difficulty swallowing food, heartburn, vomiting the past month ($p < 0.001$, $R^2 = 0.43$ parent-report; $R^2 = 0.58$, child-report)

4. Is there a profile of affected areas in life among patients with repair of EA?

ORIGINAL ARTICLE

Swallowing Dysfunction and Quality of Life in Adults With Surgically Corrected Esophageal Atresia/Tracheoesophageal Fistula as Infants

Forty Years of Follow-up

*Waleed Gibreel, MBBS, Benjamin Zendejas, MD, MSc, Ryan M. Antiel, MD, MSME, Geoffrey Fasen, MD,
Christopher R. Moir, MD, and Abdalla E. Zarroug, MD*

- 82% reported some form of swallowing difficulty
- 30% reported never having difficulty, discomfort, or pressure when swallowing hard food

→ Swallowing difficulties associated with worse generic HRQOL (SF-36)

Eating and Feeding difficulties in EA - parents/caregivers

May be related to parents' experiences of e.g.

- Fear
- Loss
- Trauma
- Worry
- Isolation
- Care needs

(Wallace et al 2022, Steward et al 2022, Gong et al 2023)

Worse family impact ($p < 0.0001$, $R^2 = 0.35$)

(Dellenmark-Blom et al 2022)

Choking incidents in childhood may leave traumatic prints among caregivers into their children's adulthood

(ten Kate et al 2021)



4. Is there a profile of affected areas in life among patients with repair of EA?

2. *Body perception and appearance*



4. Is there a profile of affected areas in life among patients with repair of EA?

Body perception and appearance

Children

“I think about it a lot, that it doesn't look normal to have a scar like I have”

“I carry my scars with pride”

Dellenmark-Blom et al 2016

Adults

“I had my scars realigned and it made them worse, I've always hated my stomach, and hate explaining my scars”

“my scars are my badge. They are me. I had a chance to 'fix' them but when it came to it I couldn't do it. They are part of me and who I am”

Ten Kate et al 2021, Rabone & Wallace 2021

4. Is there a profile of affected areas in life among patients with repair of EA?

Percentage (%) of child-reported impact (n=84, 10 countries) the past four weeks

■ Never ■ Rarely ■ Sometimes ■ Often ■ Always

I am unhappy with they way I look because of my scar(s)



I feel awkward when my scar(s) are visible to others



I am careful what I wear because of my scar(s)



I feel different because I have scars



I get tired of people asking me about the scar(s)



4. Is there a profile of affected areas in life among patients with repair of EA?

Thoracoscopic repair

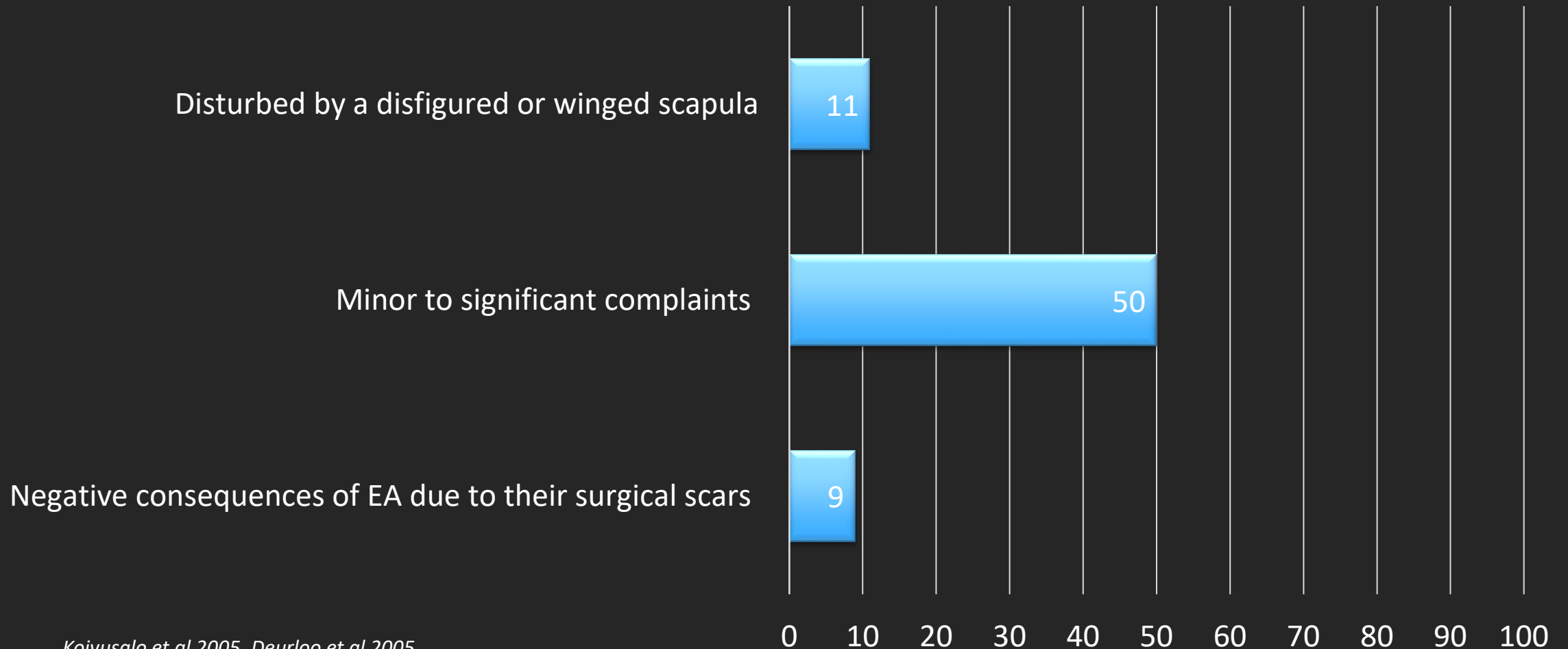
- Better EA-QOL scores in the “Body perception” domain *(Feng et al 2024)*

Associated anomalies and increased number of digestive symptoms

- Worse EA-QOL scores in the “Body perception” domain *(Dellenmark-Blom et al 2019)*

4. Is there a profile of affected areas in life among patients with repair of EA?

Percentage (%) of adult-reported impact



Koivusalo et al 2005, Deurloo et al 2005

4. Is there a profile of affected areas in life among patients with repair of EA?

3. *Mental health challenges/difficulties*

Children

“It feels very emotional and sad when I think about that I was born with EA and all the things that I have been through”

Dellenmark-Blom et al 2016

Adults

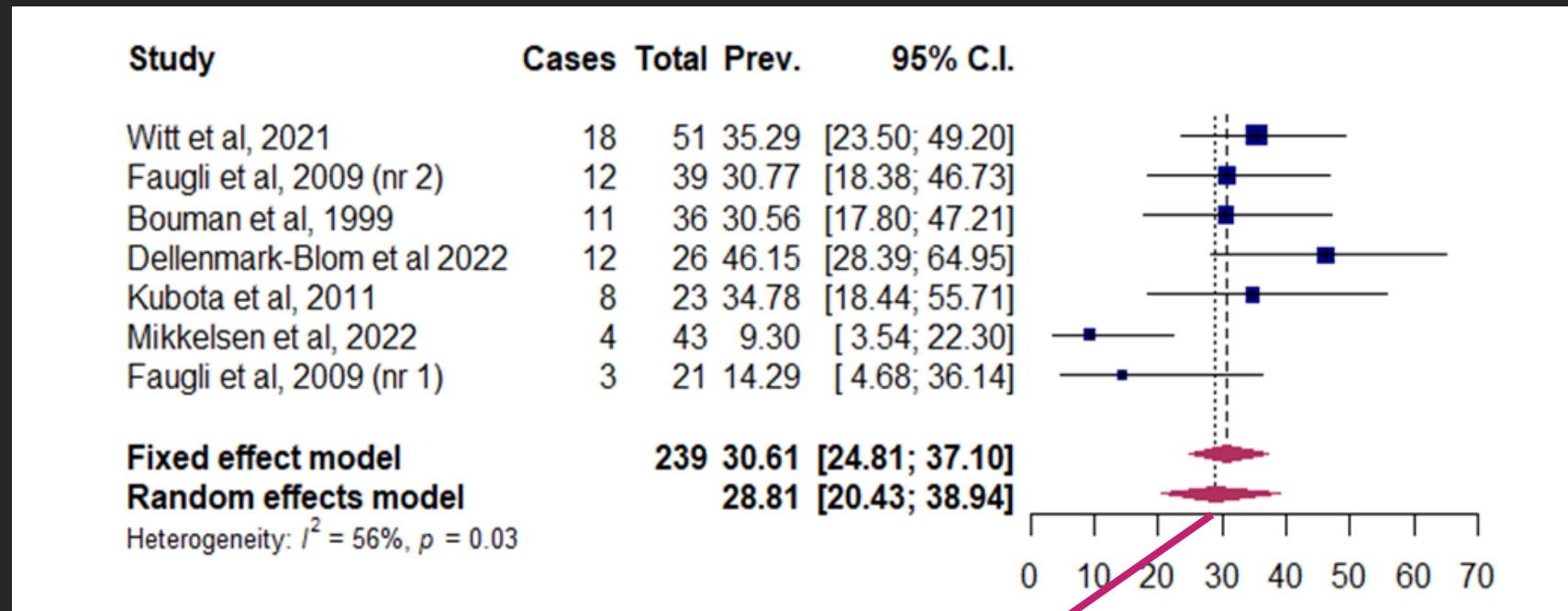
“The emotional effect [of EA/TEF] has been enormous. The trauma relates more to medical events from my childhood [...] As a child I had some extremely frightening ...”

Ten Kate et al 2021, Rabone & Wallace 2021

4. Is there a profile of affected areas in life among patients with repair of EA?

Metaanalysis

mental health difficulties in children with repair of EA



Almost 1/3 children with repair of EA is reported elevated levels of mental health difficulties including overall internalizing and externalizing symptoms

4. Is there a profile of affected areas in life among patients with repair of EA?

Adults with repair of EA

- Qualitative studies
 - Anxiety *(Rabone & Wallace)*
 - Psychological distress and trauma *(Rabone & Wallace)*
- 9-23% Depression *(Brooks et al 2022, Dingemann et al 2014)*
- 9.6- 11.6% Mental health problems *(ten Kate et al 2022, Brooks et al 2022)*

1.66 times higher risk of Autism-Spectrum Disorders compared with controls

Registry study: 735 patients with EA born in Sweden in 1973–2018 *(Kassa et al 2023)*

4. Is there a profile of affected areas in life among patients with repair of EA?

4. Social relationships, interaction, participation

Children

“I was never allowed to participate in the football games because I was too bad and the coach only wanted to win, so I quit”

- Comments from others
- Need to explain
- Social withdrawal/avoidance
- Social exclusion

Dellenmark-Blom et al 2016

Adults

“I often avoid going out for meals or eating in crowded places due to worrying about how long it takes me to eat and having any issues in public.”

- Comments from others
- Need to explain
- Social withdrawal/avoidance

Ten Kate et al 2021, Rabone & Wallace 2021

4. Is there a profile of affected areas in life among patients with repair of EA?

Social interaction, relationships, participation in children with repair of EA

- 31-34% problems with peer relationships *(Dellenmark-Blom et al 2022, Witt et al 2021)*
- Reduced school functioning compared to healthy/general norms *(Flieder et al, Mikkelsen et al, Feng et al, van Tuyll et al, ten Kate et al)*
- 25 -36 % absence from school \geq 1 month/year, ie at least 12 times a year
 - Related to young child age and persistent respiratory symptoms *(Dellenmark-Blom et al 2017, Dellenmark-Blom et al 2023)*

4. Is there a profile of affected areas in life among patients with repair of EA?

Social interaction, relationships, participation

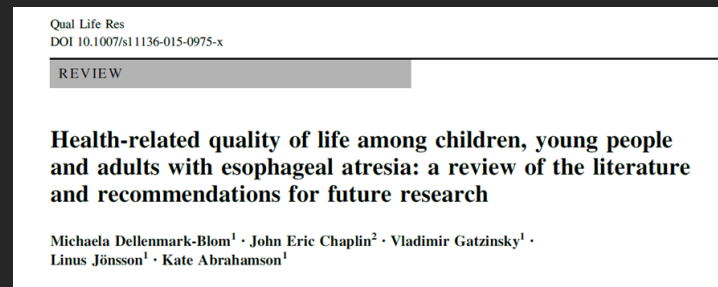
- Social withdrawal
- Absence from school and work

Ten Kate et al 2021, Rabone & Wallace 2021

To what extent?

5. Is there a profile of affected areas in life among patients with repair of EA?

The patients' experiences of Digestive, Feeding and Respiratory symptoms



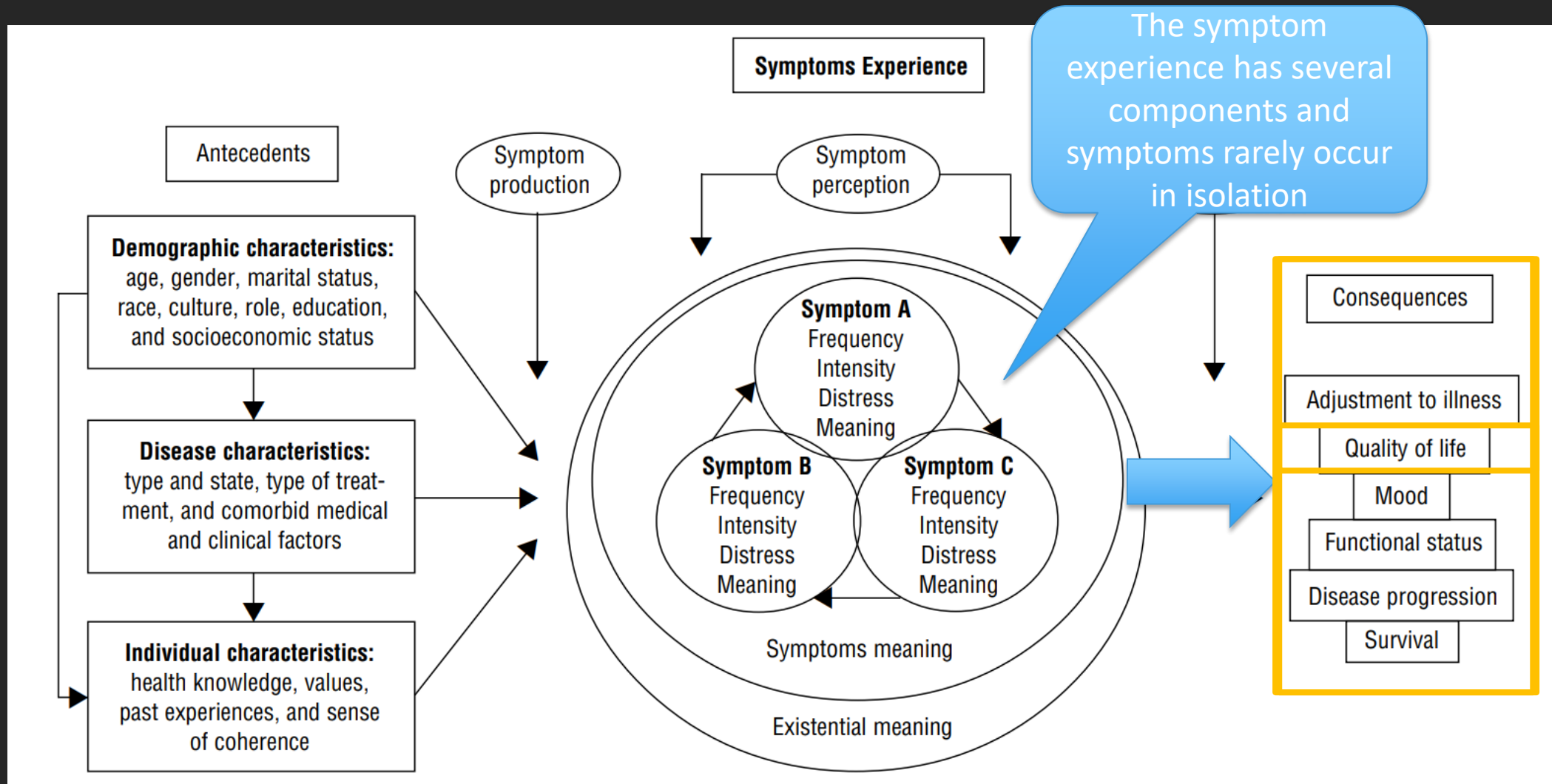
+ ongoing update

At categorial level

→ Associated with worse EA-QOL with moderate to large effect sizes (clinical meaningfulness)

→ Associated with worse SQEA scores with small to moderate effect sizes (clinical meaningfulness)

A model to understand symptom experiences...



Armstrong 2003

Patient-Reported Outcome Measurements – “Symptom Burden” in EA for use in clinical practice and research

...to help improve health and HRQoL

A Patient-Reported Outcome Measurement helps focusing on health outcomes important for you



- Teunissen et al 2023, Variability in the Reporting of Baseline Characteristics, Treatment, and Outcomes in Esophageal Atresia Publications: A Systematic Review
- Teunissen & Wijnen 2024, Unlocking the Power of Data: Standardized Data Collection in Pediatric Surgery
- Ducey J, Lansdale N, Gorst S, Bray L, Teunissen N, Cullis P, Faulkner J, Gray V, Gutierrez Gammino L, Slater G, Baird L, Adams A, Brendel J, Donne A, Folaranmi E, Hopwood L, Long AM, Losty PD, Benscoter D, de Vos C, King S, Kovesi T, Krishnan U, Nah SA, Ong LY, Rutter M, Teague WJ, Zorn AM, Hall NJ, Thursfield R. Developing a core outcome set for the health outcomes for children and adults with congenital oesophageal atresia and/or tracheo-oesophageal fistula: OCELOT task group study protocol. *BMJ Paediatr Open*. 2024 Feb 5;8(1):e002262. doi: 10.1136/bmjpo-2023-002262. PMID: 38316469; PMCID: PMC10860107.

Ongoing project in EA

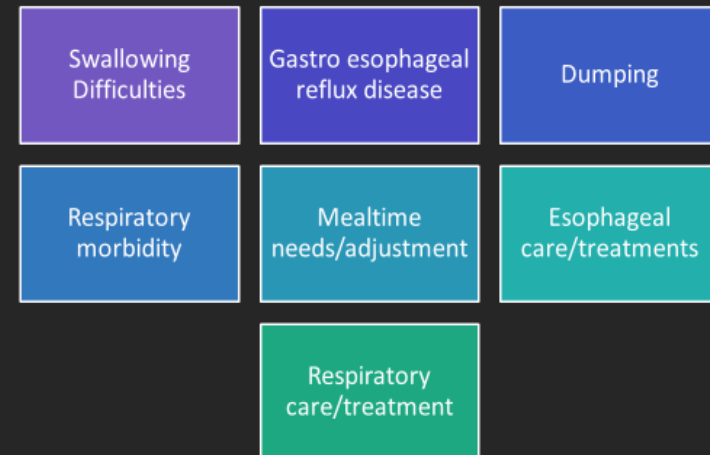
Development of Patient-reported Outcome and Experience Measurements focusing on Symptom Burden in children and adults born with Esophageal Atresia and their experiences of the received Care/Treatment

- Symptom frequency
- Symptom severity
- Received care/treatment for symptom relief

Principal Investigators

- Michaela Dellenmark-Blom, Queen Silvia Children's Hospital Gothenburg, Sweden & Karolinska Institutet, Stockholm, Sweden
- Benjamin Zendejas, Esophageal and Airway Treatment Center, Boston Children's Hospital, USA
- EAT, the global support group for esophageal atresia

Possible disease-specific consequences in EA



5. Take home message-

The holistic view for a holistic care

- **Impact?** People with repair of EA may experience physical, mental and social disease-specific impact
- **Ask -In what way, for whom and to what extent?**
Common “thematic areas” affected in subgroups
 - Eating
 - Body perception and appearance
 - Mental health difficulties
 - Social relationships, interaction, participation
 - Symptom experiences
- Some puzzle pieces have come together BUT, **more research within this field is warranted**
- Further understanding of **Symptom Burden Experiences and such PRO measurements** are needed
- **Future outlook:** care and treatment strategies needs to take all this into account

Article 24 -health and health services

Every child has the right to the best possible health

Article 12 - respect for the views of the child

Every child has the right to express their views, feelings and wishes in all matters affecting them, and to have their views considered and taken seriously



Thank you for listening!

UN resolution (2021)

Addressing the challenges of persons living with a rare disease and their families

1.

“Recognizing that persons living with a rare disease and their families may be **psychologically, socially and economically vulnerable** throughout their life course, facing specific challenges in several areas, including but **not limited to health**, education, employment and leisure”

2.

“Reaffirming **the right of every human being**, without distinction of any kind, to the enjoyment of the highest attainable standard of **physical and mental health** and to a standard of living adequate for the health and well-being of oneself and one’s family”

3.

“Urges Member States to **implement effective programmes to promote mental health** and psychosocial support for persons living with a rare disease, and to promote policies and programmes that enhance the well-being of **their families and caregivers**”

Meaningfulness & Resilience

Child

“Sometimes when I feel bothered by my condition, I think that I have been lucky in life because I actually should not be here”

”It’s exciting to be this unique!”

”I am glad and proud to have been born with EA”

Adult

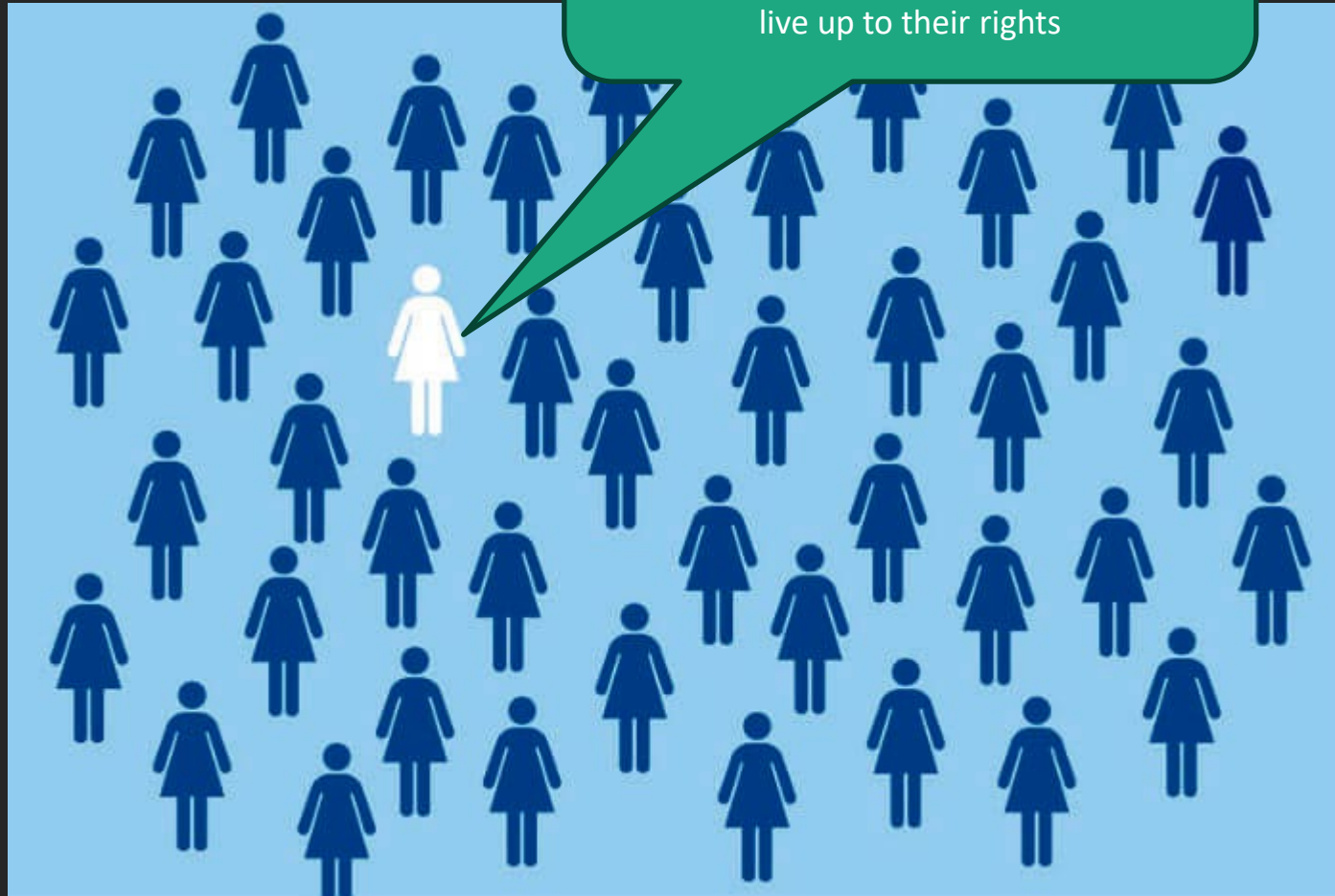
“Extremely lucky, I feel as if I’ve had someone watch over me from the moment I was born! I feel inspired to do the best for myself as I’ve been given a chance to live and survive with my condition”

“I feel grateful and lucky to be here. I have a sense of pride in my condition, but I am aware that I don’t have as many issues as other TOF survivors and that’s where my feeling of gratefulness comes from”

Dellenmark-Blom 2015, 2016

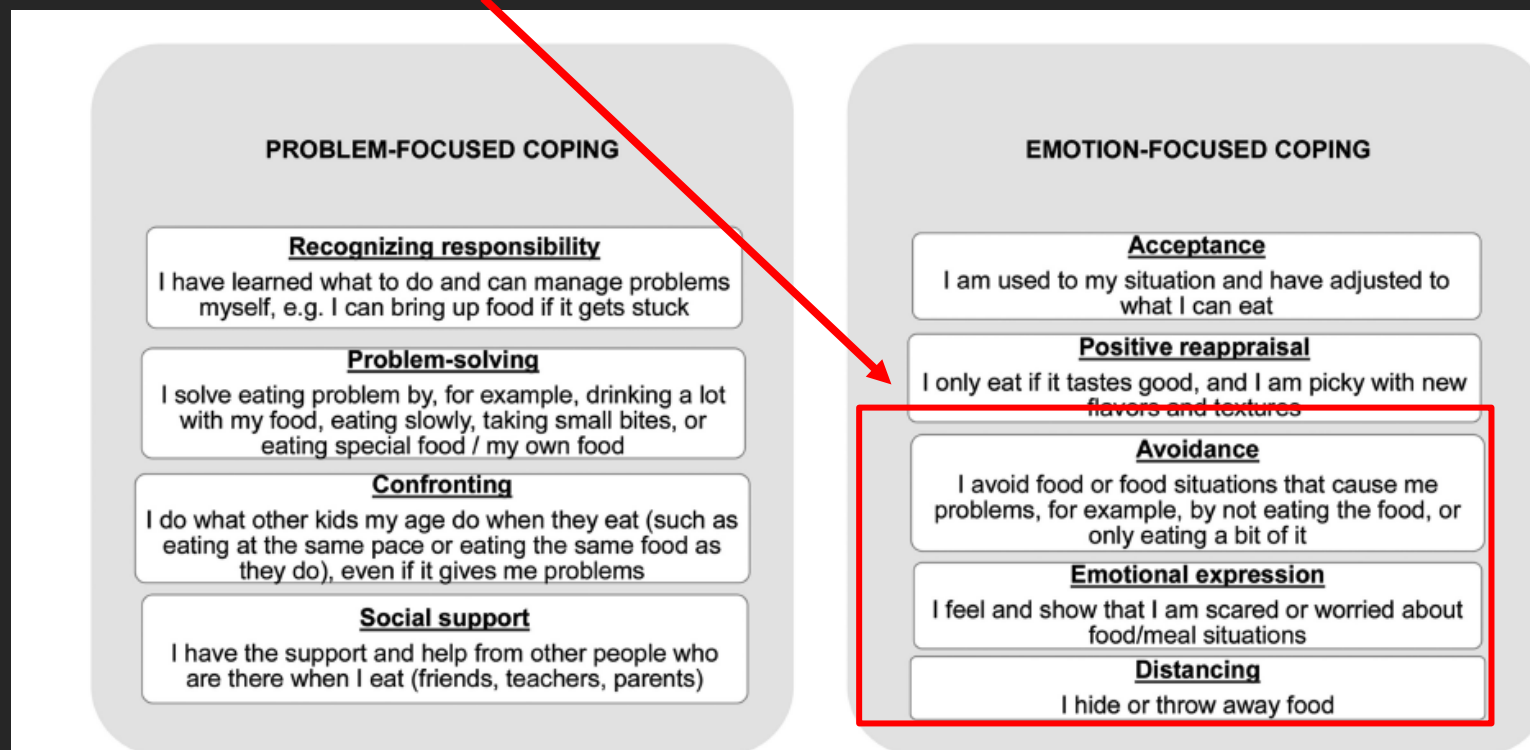
Rabone & Wallace 2021

Patient-Reported Outcome Research can capture the voices of people with a rare disease, so that we can listen better to health needs they feel are important and live up to their rights



5. Is there a profile of affected areas in life among patients with repair of EA?

- In total 77% of children with EA reported use of coping in nutritional intake situations, a mean of 6 coping strategies (range: 3–9)
- A correlation cluster- avoiding nutritional intake situations, expressing fear or worry about them or distancing from eating or food - the so-called disengagement strategies
- → were associated with worse HRQOL-eating, independent of disease severity



Child: care, health and development
Original Article doi:10.1111/och.12372

Coping strategies used by children and adolescents born with esophageal atresia – a focus group study obtaining the child and parent perspective

M. Dellenmark-Blom,^{*} J. E. Chaplin,^{*} L. Jönsson,[†] V. Gatzinsky,[‡] J. H. Quitmann,[§] and K. Abrahamsson,[¶]†

Journal of the Esophagus 2019; 1-9
DOI: 10.1093/esopha/ehz001

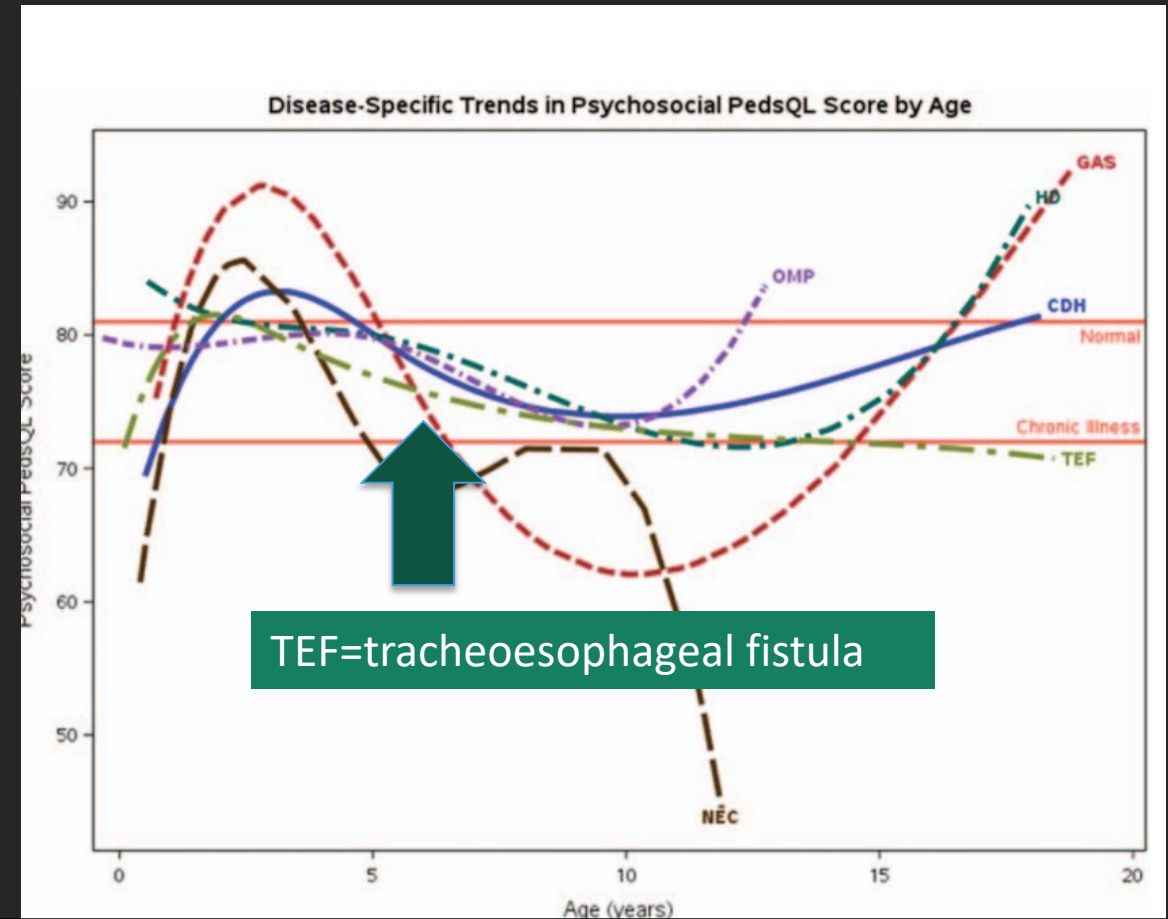
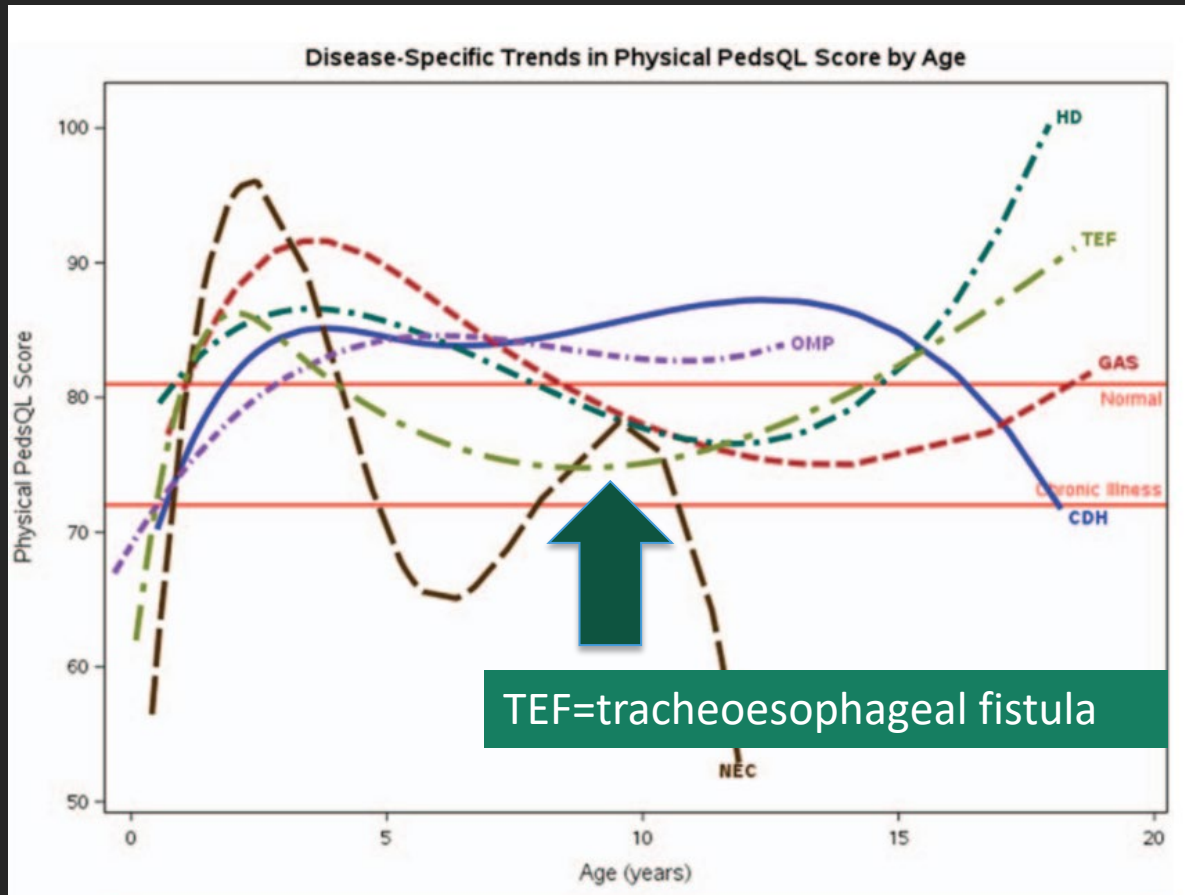
DISEASES OF THE ESOPHAGUS ISDE

Original Article

The prevalence and role of coping strategies in the nutritional intake of children born with esophageal atresia: a condition-specific approach

M. Dellenmark-Blom,^{1,2} J. E. Chaplin,¹ J. H. Quitmann,³ L. Jönsson,² V. Gatzinsky,² J. Dingemans,^{4,5} K. Abrahamsson,^{1,6,7}

2. Do we know how HRQoL in patients with repair of EA develops from childhood into adulthood?



Physical functioning may improve into adulthood while psychosocial functioning may worsen
However, only one study available

Amin et al 2018

Possible disease-specific consequences in EA

Swallowing
Difficulties

Gastro esophageal
reflux disease

Dumping

Respiratory
morbidity

Mealtime
needs/adjustment

Esophageal
care/treatments

Respiratory
care/treatment

4. Is there a profile of affected areas in life among patients with repair of EA?

Original Article

Clinical Factors Affecting Condition-Specific Quality-of-Life Domains in Pediatric Patients after Repair of Esophageal Atresia: The Swedish-German EA-QOL Study

Michaela Dellenmark-Blom^{1,2} Julia Quitmann³ Jens Dingemann⁴ Stefanie Witt³ Benno M. Ure⁴
Monika Bullinger³ Linus Jönsson² Vladimir Gatzinsky² Carmen Dingemann⁴

The impact of digestive^a symptoms and respiratory symptoms^b on the HRQOL- eating scores in children with EA aged 2 to 7 (parent reports) and 8 to 17 years (child and parent report)

	Digestive symptoms ^a				Respiratory symptoms			
	β_0	β_1	R ²	p-value	β_0	β_1	R ²	p-value
2-7 years old								
Eating (parent-report)	90.3	-14.1	0.44	<0.001	82.2	-4.2	0.09	0.050
8-17 years old								
Eating (child-report)	86.3	-14.4	0.58	<0.001	77.4	-4.7	0.07	<0.05
Eating (parent-report)	86.9	-13.8	0.43	<0.001	78.0	-5.4	0.08	<0.05

^aDigestive symptoms ($n_{\max}=3$); food impaction/difficulty swallowing food, heartburn, vomiting

^bRespiratory symptoms ($n_{\max}=5$); cough, wheezing at physical activity/at rest, airway infections, breathlessness on physical exertion/at rest, chest tightness