SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY

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UNIVERSITAT ROVIRA i VIRGILI

Self-disgust in Chinese patients with colostomy: an exploratory study

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Doctoral Thesis

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Universitat Rovira i Virgili (URV)

Department of Nursing

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FAIG CONSTAR que aquest treball, titulat "Self-disgust in Chinese patients with colostomy: an exploratory study", que presenta Yanfei Jin per a l'obtenció del títol de Doctor, ha estat realitzat sota la meva direcció al Departament d'Infermeria d'aquesta universitat.

HAGO CONSTAR que el presente trabajo, titulado "Self-disgust in Chinese patients with colostomy: an exploratory study", que presenta Yanfei Jin para la obtención del título de Doctor, ha sido realizado bajo mi dirección en el Departamento de Enfermería de esta universidad.

I STATE that the present study, entitled "Self-disgust in Chinese patients with colostomy: an exploratory study", presented by Yanfei Jin for the award of the degree of Doctor, has been carried out under my supervision at the Department of Nursing of this university.

Tarragona, 9 de setembre de 2020

Maria Jiménez-Herrera, phD, NR, MB

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Curriculum Vitae

After graduating with a Bachelor of Medicine in Nursing from the Hubei Minzu University in June **2012**, Yanfei began her master degree at Tianjin University of Traditional Chinese Medicine, where she worked from September **2013** to July **2016** under the supervision of Prof. Changde Jin. During her master studies, she focused on chronic disease research and psychological nursing, and published 5 papers in Chinese core journals. Due to her outstanding performance during master studies, she won the national scholarship in **2015**. Her master thesis work was supported by the Tianjin University of Traditional Chinese Medicine and received a master's degree in medicine nursing in the summer of **2016**. Fascinated by nursing and health, and in search of exciting new challenges and opportunities, she applied for a PhD position within the doctoral program of University of Rovira i Virigili (URV) in Spain. During her doctoral studies at the URV as a member of the research group, Professor Maria Jimenez-Herrera has tutored me in the psychological nursing care of patients with mental disorders and colostomy.

The PhD thesis results have been published in SCI index as first author, such as the Clinical Psychology & Psychotherapy (doi: 10.1002/cpp.2459, **2020**), Journal of Advanced Nursing (doi: 10.1111/jan.14457, **2020**) and European Journal of Cancer Care (doi: 10.111/ecc.13323, **2020**).

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UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

Table of Contents

Summary ..... **I**

Resumen ..... **IV**

Resum ..... **VII**

1. Introduction **1**

2. Background **3**

2.1 Conceptualization of self-disgust 3

2.2 The relationship between self-disgust and mental disorder 3

2.3 The relationship between disgust/ self-disgust and colostomy 4

2.4 Measurement of self-disgust 5

2.5 Literature review summary 7

2.5.1 The importance of a precise measure of self-disgust 7

2.5.2 Focusing on self-disgust is a new direction to improve patients' stoma care 8

2.5.3 Lack of measurement to specifically assess colostomy-specific disgust 9

3. Aims of study **11**

4. Hypothesis **13**

5. Methods **15**

5.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China 15

5.1.1 Design 15

5.1.2 Study sample 16

5.1.3 Data collection procedure 16

5.1.4 Ethical approval and considerations 16

5.1.5 Measurement 16

Table of Contents

5.1.6 Statistical methods..... 18

5.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy..... 18

5.2.1 Design..... 18

5.2.2 Study sample..... 19

5.2.3 Data collection procedure..... 19

5.2.4 Ethical approval and considerations..... 19

5.2.5 Measurement..... 19

5.2.6 Statistical methods..... 22

5.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy..... 22

5.3.1 Design..... 22

5.3.2 Study sample..... 23

5.3.3 Data collection procedure..... 24

5.3.4 Ethical approval and considerations..... 24

5.3.5 Measurement..... 25

5.3.6 Statistical methods..... 25

6. Results..... 27

6.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China..... 27

6.1.1 Characteristics of the participants..... 27

6.1.2 Validity..... 28

6.1.3 Reliability..... 32

6.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy..... 33

6.2.1 Characteristics of the participants..... 33

6.2.2 Descriptive and reliability..... 34

Table of Contents

6.2.3 Correlation analysis....35
6.2.4 Mediation analysis.... 37
6.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy.... 40
6.3.1 Characteristics of the participants....40
6.3.2 Feasibility and initial item analysis....41
6.3.3 EFA....43
6.3.4 CFA....43
6.3.5 Internal consistency....46
6.4 Summary of main results....47
7. Discussion....49
7.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China....49
7.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy....51
7.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy.... 53
8. Limitation and future implications.... 57
9. Relevance and Applicability....59
9.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China....59
9.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy....59
9.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy.... 60
10. Conclusion.... 59

Table of Contents

10.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China....61

10.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy....61

10.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy....61

Reference....63

List of tables....77

List of figures....78

List of abbreviations....79

List of publications....80

Addendum....81

Addendum Nº1(Original article)....83

Addendum Nº2(Original article)....95

Addendum Nº3(Original article)....107

Summary

Title: Self-disgust in Chinese patients with colostomy: an exploratory study

Background: Self-disgust is a persistent and maladaptive disgust response, reflecting a harsh, noxious and embodied feeling state. Studies have shown that self-disgust plays a critical role in mental disorders, and even negatively predicts mental health, especially in relation to cancer and disfigurement, which involve changes to the body.

Aim: The aims of this thesis were the examination of self-disgust and exploration of its role in mental health, including in mental disorders and colostomy patients, and the development of a special measurement to evaluate the specific disgust among colostomy patients.

Methods: Three studies have been done to perform this thesis:

- Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China
- Study 2: Self-Disgust and Stigma both Mediate the Relationship between Stoma Acceptance and Stoma Care Self-Efficacy
- Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

This thesis was based on cross-sectional studies conducted in psychiatric hospitals and tertiary hospitals in China from 2015 to 2020. We recruited 1086 mental disorders from two psychiatric hospitals and three tertiary psychological clinics for psychometric evaluation of the Questionnaire for the Assessment of Self-Disgust （QASD). Two separate samples of colostomy patients recruited from the stoma clinic of a tertiary hospital (one sample was used to explore the relationship between stoma acceptance and stoma care self-efficacy in colostomy patients, and whether

Summary

self-disgust and stigma play mediating roles in this relationship; Another sample was used to establish and validate the Colostomy Disgust Scale (CDS) for assessing disgust in colostomy patients).

Result: The result obtained from study 1 showed that ……In the psychometric evaluation of QASD, multi-group confirmatory factor analysis (CFA) supported the two-factor structure of the original QASD construct. Measurement invariance showed that the QASD is invariant across the patients with heterogeneous mental health diagnoses. The correlation of QASD with the Self-esteem Scale (SES) and the Trait Anger Scale (TAS) showed that it has good convergent validity and discriminative validity. Internal consistency and test-retest yielded acceptable results.

The study 2 results demonstrate that ……In the study of exploring the mediating role of self-disgust in colostomy patients, stoma acceptance was significantly negatively associated with personal disgust ($r = -.640$, $p<.001$), behavioral disgust ($r = -.384$, $p<.001$), and stigma ($r = -.309$, $p<.001$) and significantly positively associated with stoma care self-efficacy ($r = .689$, $p<.001$). Furthermore, regression-based mediation modelling showed that personal disgust and stigma had significant mediating effects on stoma acceptance and stoma care self-efficacy.

The study 3 showed that ……In the study of establishing and validating the Colostomy Disgust Scale (CDS), following item generation and item selection, a 22-item CDS was generated. Principal axis factoring indicated a two-factor solution for the proposed CDS model, which was also verified by confirmatory factor analysis. Moreover, the proposed CDS had a high internal consistency.

Conclusion: The Chinese version of the QASD is a reliable and valid instrument with adequate psychometric properties for assessment of self-disgust among patients with mental disorders in China; The emotional response of self-disgust plays important role in the association between stoma acceptance and stoma care self-efficacy. Addressing concerns about emotional disorder should become part of the

routine care for stoma patients; The CDS is a self-report instrument with initial evidence for its validity and reliability. It is a promising tool to identify the triggers of disgust in colostomy contexts, which can be of great importance for promoting the mental health of colostomy patients.

Key words: acceptance; colostomy; disgust; mediation analysis; mental disorders; mental health; nursing; reliability; scale; self-disgust; self-efficacy; stigma, stoma; validity.

Resumen

Título: Autorechazo en pacientes chinos con colostomía: un estudio exploratorio

Antecedentes: El autorechazo es una respuesta de repugnancia persistente e inadaptada, que refleja un estado de ánimo nocivo y profundo. Los estudios han demostrado que éste desempeña un papel fundamental en los trastornos mentales, e incluso predice negativamente la salud mental, especialmente en relación con el cáncer y los cambios corporales que implican modificaciones severas en el cuerpo.

Objetivo: Los objetivos de esta tesis fueron examinar el autorechazo y el rol que ejerce en la salud mental, examinar diferentes aspectos sobre trastornos mentales y los pacientes colostomizados y la adaptación de un instrumento de medición para evaluar el rechazo específico entre los pacientes con colostomía.

Métodos: Se han realizado tres estudios para realizar esta tesis:

- Estudio 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China
- Estudio 2: Self-Disgust and Stigma both Mediate the Relationship between Stoma Acceptance and Stoma Care Self-Efficacy
- Estudio 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

Esta tesis se basó en estudios transversales realizados en hospitales psiquiátricos y hospitales terciarios de China entre 2015 y 2020. Reclutamos 1086 pacientes con trastornos mentales de dos hospitales psiquiátricos y tres clínicas de atención psicológica terciaria para la evaluación psicométrica del Cuestionario para la Evaluación de la Autoestima (Disgust (QASD)). Se reclutaron dos muestras separadas de pacientes con colostomía de un hospital terciario (parte de la muestra se

utilizó para estudiar la relación entre la aceptación del estoma y la autoeficacia de la atención del estoma en pacientes con colostomía, y si el rechazo a sí mismo y el estigma desempeñan funciones de mediación en esta relación; otra parte de la misma, se utilizó para establecer y validar la Escala de rechazo a la colostomía (CDS) para evaluar el rechazo en pacientes con colostomía).

Resultado: El resultado obtenido del estudio 1, mostró en la evaluación psicométrica de la QASD, que el análisis factorial confirmatorio multigrupal (CFA) apoyó la estructura de dos factores del constructo original de la QASD. La invariancia de la medición mostró que el QASD es invariable en los pacientes con diagnósticos de salud mental heterogéneos. La correlación del QASD con la Escala de Autoestima (SES) y la Escala de Rasgos de Ira (TAS) mostró que tiene buena validez convergente y validez discriminatoria. La consistencia interna y el test de retorno dieron resultados aceptables.

Los resultados del estudio 2 demuestran que en el estudio de exploración del papel mediador del autorechazo en los pacientes con colostomía, la aceptación del estoma se asoció significativamente de forma negativa con el repugnancia personal ($r = -.640$, $p<.001$), el repugnancia conductual ($r = -.384$, $p<.001$) y el estigma ($r = -.309$, $p<.001$) y significativamente de forma positiva con la autoeficacia del cuidado del estoma ($r = .689$, $p<.001$). Además, la modelización de la mediación basada en la regresión demostró que el disgusto y el estigma personales tenían importantes efectos mediadores en la aceptación del estoma y la autoeficacia del tratamiento del mismo.

El estudio 3 mostró que en este estudio de establecimiento y validación de la Escala de disgusto por colostomía (CDS), tras la generación y selección de elementos, se generó un CDS de 22 elementos. La factorización del eje principal indicó una solución de dos factores para el modelo de CDS propuesto, que también se verificó mediante un análisis factorial confirmatorio. Además, el CDS propuesto tenía una gran consistencia interna.

Resumen

Conclusión: La versión china del QASD es un instrumento fiable y válido con propiedades psicométricas adecuadas para la evaluación del autorechazo entre los pacientes con trastornos mentales en China; La respuesta emocional del autorechazo desempeña un papel importante en la asociación entre la aceptación del estoma y la autoeficacia del tratamiento del estoma. El tratamiento de las preocupaciones sobre los trastornos emocionales debe formar parte de la atención rutinaria de los pacientes con estoma; El CDS es un instrumento de autocumplimiento con pruebas iniciales de su validez y fiabilidad. Es un instrumento prometedor para identificar los factores desencadenantes del rechazo en pacientes sometidos a colostomía, que pueden ser de gran importancia para promover la salud mental de los mismos.

Palabras clave: aceptación; colostomía; rechazo; análisis de mediación; trastornos mentales; salud mental; enfermería; fiabilidad; escala; autodesprecio; autoeficacia; estigma, estoma; validez.

Resum

Títol:Auto-rebuig en pacients xinesos amb colostomia: un estudi exploratori

Antecedents:El auto-rebuig és una resposta de repugnància persistent i inadaptada, que reflecteix un estat d'ànim nociu i profund. Els estudis han demostrat que aquest exerceix un paper fonamental en els trastorns mentals, i fins i tot prediu negativament la salut mental, especialment en relació amb el càncer i els canvis corporals que impliquen modificacions severes en el cos.

Objectiu: Els objectius d'aquesta tesi van ser examinar el auto-rebuig i el rol que exerceix en la salut mental, examinar diferents aspectes sobre trastorns mentals i els pacients colostomitzats, i l'adaptació d'un instrument de mesurament per a avaluar el rebuig específic entre els pacients amb colostomia.

Mètodes: S'han realitzat tres estudis per a realitzar aquesta tesi:

• Estudi 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in Xinesa

• Estudi 2: Self-Disgust and Stigma both Mediate the Relationship between Stoma Acceptance and Stoma Care Self-Efficacy

• Estudi 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

Aquesta tesi es va basar en estudis transversals realitzats en hospitals psiquiàtrics i hospitals terciaris de la Xina entre 2015 i 2020. Reclutem 1086 pacients amb trastorns mentals de dos hospitals psiquiàtrics i tres clíniques d'atenció psicològica terciària per a l'avaluació psicomètrica del Qüestionari per a l'Avaluació de l'Autoestima (Disgust （ QASD)). Es van reclutar dues mostres separades de pacients amb colostomia d'un hospital terciari (part de la mostra es va utilitzar per a estudiar la relació entre l'acceptació de l'estoma i l'autoeficàcia de l'atenció de l'estoma en pacients amb colostomia, i si el rebuig a si mateix i l'estigma exerceixen funcions de

mediació en aquesta relació; una altra part d'aquesta, es va utilitzar per a establir i validar l'Escala de rebuig a la colostomia (CDS) per a avaluar el rebuig en pacients amb colostomia).

Resultat: El resultat obtingut de l'estudi 1, va mostrar en l'avaluació psicomètrica de la QASD, que l'anàlisi factorial confirmatòria multigrupal (CFA) va donar suport a l'estructura de dos factors del constructe original de la QASD. La invariància del mesurament va mostrar que el QASD és invariable en els pacients amb diagnòstics de salut mental heterogenis. La correlació del QASD amb l'Escala d'Autoestima (SES) i l'Escala de Trets d'Ira (TAS) va mostrar que té bona validesa convergent i validesa discriminatòria. La consistència interna i el test de retorn van donar resultats acceptables.

Els resultats de l'estudi 2 demostren que en l'estudi d'exploració del paper mediador del auto-rebuig en els pacients amb colostomia, l'acceptació de l'estoma es va associar significativament de manera negativa amb el repugnància personal ($r = -.640$, $p<.001$), el repugnància conductual ($r = -.384$, $p<.001$) i l'estigma ($r = -.309$, $p<.001$) i significativament de manera positiva amb l'autoeficàcia de la cura de l'estoma ($r = .689$, $p<.001$). A més, la modelització de la mediació basada en la regressió va demostrar que el disgust i l'estigma personals tenien importants efectes mediadors en l'acceptació de l'estoma i l'autoeficàcia del tractament d'aquest.

L'estudi 3 va mostrar que en aquest estudi d'establiment i validació de l'Escala de disgust per colostomia (CDS), després de la generació i selecció d'elements, es va generar una escala CDS de 22 elements. La factorització de l'eix principal va indicar una solució de dos factors per al model de CDS proposat, que també es va verificar mitjançant una anàlisi factorial confirmatòria. A més, el CDS proposat tenia una gran consistència interna.

Conclusió: La versió xinesa del QASD és un instrument fiable i vàlid amb propietats psicomètriques adequades per a l'avaluació del auto-rebuig entre els

pacients amb trastorns mentals a la Xina; La resposta emocional del auto-rebuig exerceix un paper important en l'associació entre l'acceptació de l'estoma i l'autoeficàcia del tractament de l'estoma. El tractament de les preocupacions sobre els trastorns emocionals ha de formar part de l'atenció rutinària dels pacients amb estoma; El CDS és un instrument de auto-compliment amb proves inicials de validesa i fiabilitat. És un instrument prometedor per a identificar els factors desencadenants del rebuig en pacients sotmesos a colostomia, que poden ser de gran importància per a promoure la salut mental d'aquests.

Paraules clau: acceptació; colostomia; rebuig; anàlisi de mediació; trastorns mentals; salut mental; infermeria; fiabilitat; escala; auto-rebuig; autoeficàcia; estigma, estoma; validesa.

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1. Introduction

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1. Introduction

Disgust has commonly been conceptualized as an emotional response of our body to maintain distance from the external stimulus that may be offensive or unpleasant (Ekman, 1999; Gilbert, 2015), and its basic purpose is to motivate us to protect ourselves from disease (Curtis, Aunger & Rabie, 2004). Generally, disgust elicitors are classified into seven domains: foods (e.g., contaminated foods), animals, bodily products (e.g., waste), hygiene (e.g., body odour), sex, body envelope violations (e.g., deformity/disfigurement), and death (Rozin, Haidt & McCauley, 2008). All of these stimuli are potential contaminants and, disgust, as a disease-avoidance mechanism, motivates their rejection and withdrawal. Through evolutionary exaptation, disgust has expanded to a broader aspect, including immoral behaviour, social violations, and ill interpersonal relationships.

As stated in Davey (1994), "Disgust has shown a great potential for being transferred to objects, as well as to other individuals and, in some instances, to the self" Although the disgust response serves as an important and adaptive function in the external stimulus, feelings of disgust may be generalized and directed towards the self when some aspects are seen as toxic, repugnant, or even dangerous, and this type of disgust response has been labelled as self-disgust (Ille et al., 2014; Power, & Dalgleish, 1997; Rozin, Haidt, & McCauley, 2000).

The experience of self-disgust is accompanied by behavioural and physiological processes similar to externally directed disgust (Barret, Zahn-Waxler & Cole, 1993; Overton et al., 2008). The typical behavior tendency associated with disgust is one of rejection and avoidance (Rozin et al., 2000). The behaviors of avoidance-based strategies can be particularly serious when the stimulus producing disgust is internal or a part of the self. As with the external disgust response, such avoidance may inadvertently maintain the disgust reaction through negative reinforcement. Moreover,

once acquired, the disgust response may be particularly difficult to unlearn (Olatunji, Forsyth, & Cherian, 2007; Sawchuk, 2009).

Given that self-disgust is particularly enduring and that avoidance-based strategies seem to produce unwanted effects, individuals with self-disgust may become somehow trapped with the desire to get rid of those parts considered disgusting (Powell et al., 2013). That being said, individuals exhibiting self-disgust may engage in some degree of evasion, such as avoiding touching or looking at themselves (Espeset et al., 2012), and masking aspects they perceive as abhorrent. As a disease-avoidance mechanism, self-disgust responding has a particular relevance in understanding people's psychological reactions to disease.

Until now, self-disgust has been shown to be a significant temporal antecedent of depressive symptoms (Overton et al., 2008), and has also been linked to anxious responding (Olatunji et al., 2015). Furthermore, self-directed disgust has an important role in chronic physical health conditions, including cancer and its treatment (Reynolds, Bissett & Consedine, 2015). In the recent published literature, the self-disgust has been reported to be associated with psychological status and health behavior in colorectal cancer and colostomy (Espeset et al., 2012; Reynolds, Bissett & Consedine, 2015). Therefore, we can speculate that exploring the psychological construct of self-disgust in mental disorders and investigating the role of self-disgust in colostomy patients would be particularly important for health promotion.

2. Background

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2. Background

2.1 Conceptualization of self-disgust

As a relatively novel topic for psychological enquiry, the preceding literature on self-disgust has culminated in a concept that is shrouded in ambiguity. Recent publications have conceptualized that self-disgust is a persistent and maladaptive self-directed disgust response, reflecting a harsh, noxious and embodied feeling state (Olatunji, David, & Ciesielski, 2012; Roberts & Goldenberg, 2007). With the in-depth exploration of the theoretical construct of self-disgust, self-disgust has been found to be intrinsically linked to other negative self-directed emotions, such as guilt, shame, and self-hatred that, when directed towards one's self, may be extremely pathogenic (Gilbert, 2015; Powell et al., 2015a). However, recent views argued that the centrality of the core emotion of disgust does enable self-disgust to be differentiated from other negative self-directed emotions across appraisal content, subjective and physiological experiences, and associated behavioural repertoires (Powell et al., 2015a; Powell et al., 2015b). Specifically, self-disgust reflects an important and distinct emotional construct (Roberts & Goldenberg, 2007; Powell et al., 2015a). It is considered a stable and dysfunctional psychological phenomenon that encloses two interrelated domains of the self: disgust directed towards own physical appearance and personality (physical self-disgust; e.g., "I find myself repulsive") and disgust directed towards one's actions (behavioural self-disgust; e.g., "I regret my behaviour") (Schienle et al., 2014).

2.2 The relationship between self-disgust and mental disorder

In the present, with the attractive increasing recognition of self-disgust in the clinical domain, a number of studies have correlated self-disgust with varying numbers of psychopathology. It has been shown to be involved in a number of mental

health issues, including depression (Overton et al., 2008; Powell, Overton, & Simpson, 2014b; Powell et al., 2016; Simpson et al., 2010; Ypsilanti et al., 2019), sexual dysfunction (de Jong, & Borg, 2015), borderline personality disorder (BPD; Abdul-Hamid, Denman, & Dudas, 2014; Rüsch et al., 2010; Schienle et al., 2003), unhealthy behavior (Palmeira, Pinto-Gouveia, & Cunha, 2017), and anxiety (Amir et al., 2010; Olatunji, Cox, & Kim, 2015; Powell et al., 2016). Furthermore, self-disgust has also been proposed to function as a bridge between dysfunctional cognitions and the symptomatology typical of depression (Whelton & Greenberg, 2005; Simpson et al., 2010). Finally, it has been shown to be a significant strong predictor of specific psychological problem, such as self-harm urges (Abdul-Hamid, Denman & Dudas, 2014) and suicide risk (Brake et al., 2017).

Elevated self-disgust is dysfunctional, therefore it is associated with different mental disorders. Given previous theoretical associations have been made between self-disgust and other psychological phenomena, they suggest that the early detection and treatment of self-disgust may be important for prevention of clinical mental health problems (Schienle et al., 2014).

2.3 The relationship between disgust/ self-disgust and colostomy

Qualitative studies have shown that colostomy patients often report themes related to disgust (Turner et al., 2008; Powell et al., 2016; Smith et al., 2007). For patients who have undergone colostomy surgeries lose regular bowel function and, as a consequence, their normal waste passes through the abdominal wall into a medical appliance known as stoma. Fundamentally, a stoma involves closer contact with fecal matter than would normally occur during an individual's typical bowel movements. Apart from feces, multiple disgust elicitors are associated with colostomy, including body fluids (e.g., blood), body envelope violations (e.g., colonoscopy insertion, surgical incision, and wound appearance), hygiene (e.g., unpleasant odor), and death (Haidt, McCauley & Rozin, 1994; Reynolds, Bissett & Consedine, 2018; Reynolds,

Consedine & McCambridge, 2014a). Given its evolutionary grounding as a vital element of "behavioral immune system" (Schaller & Park, 2011), disgust has a particular relevance in facilitating psychological reactions to disease and its treatment (Reynolds et al., 2013).

Generally, individuals use the same psychological mechanisms (e.g., avoidance and rejection) to deal with internal and external threats, but this can be especially difficult when the stimulus that causes disgust is the self (Gilbert, 2005). Accordingly, individuals with self-disgust may have stronger avoidance and rejection behaviors, such as avoiding touching or looking at themselves, masking the disgusting aspects of themselves, and even trying to distract themselves from the disliked object (Espeset et al., 2012). We can speculate that these avoidance-based strategies may have an adverse effect, leading to a lack of competence in self-management Therefore, it is particularly important to explore the role of self-disgust in colostomy patients. Recent studies have shown that the unregulated disgust reaction is perceived as particularly threatening to colostomy patients. For instance, being more prone to disgust can predict the increased stigma experiences, inadequate levels of adjustment and overall life satisfaction (Simpson et al., 2006), lack of help-seeking behavior (Reynolds et al., 2014), and social avoidance (Reynolds, Bissett & Consedine, 2015).

2.4 Measurement of self-disgust

Thus far, research investigating self-disgust has involved self-report questionnaires and standardized quantitative methodology. Two multi-item measures of self-disgust have been developed and validated in the literature. The Self-Disgust Scale (SDS; Overton et al., 2008), developed in a sample of 111 college students, provided the first evidence on the factor structure of self-disgust. The SDS composes two factors, with five items representing disgust towards physical aspects of the self (e.g., "I find myself repulsive"), and five items representing disgust towards

behavior/actions (e.g., "I often do things I find revolting"). All items are rated on a 7-point Likert scale (1=strongly agree, 7=strongly disagree). The total score reflects the level of self-disgust, with higher values indicating more self-disgust. The SDS has demonstrated a reliable measure in non-clinical samples, with strong internal consistency, test-retest reliability, and content and concurrent validity (Overton et al., 2008; Simpson et al., 2010; Brake et al., 2017).

As the first scale of its kind, the SDS appears to be a promising manifest self-report measure to tap into the latent, cognitive-affective trait of self-disgust. However, the scale does present some limitations. The first shortcoming is the method used to construct the factors. In this scale, the factor structure of self-disgust obtained by principal component analysis cannot be interpreted as latent traits. Moreover, the authors implicitly assumed a hierarchical structure of self-disgust by calculating a composite score, although they chose an orthogonal rotation method to obtain a more readily interpretable simple structure. The second shortcoming involves the size and composition of the sample, Overton et al. (2008) combined a relatively small sample of mentally healthy individuals with a low set of indicator variables to measure different aspects of self-disgust. These limitations are known to affect the property of factor-analytic methods aiming to find stable factor structures with unbiased estimates of factor loadings. Resulting from the restraint of healthy respondents, concern exists about whether the results can be generalized to different psychopathologies.

Considering the aforementioned shortcomings of SDS, Schienle et al. (2014) constructed a new questionnaire for the assessment of self-disgust (QASD). The QASD is a 14-item, self-report measurement for self-disgust that can be used in clinical and non-clinical samples (Schienle et al., 2014). It contains two subscales: "personal disgust", which has nine items that assess the devaluation of one's physical appearance and personality, and "behavioral disgust", which has five items that assess the devaluation of one's behavior. All items are rated on a 5-point Likert scale (0=not

true at all to 4=absolutely true). The total score reflects the level of self-disgust, with higher values indicating more self-disgust. The subsequent studies using the QASD report strong internal consistency and test–retest reliability (Schienle, Leutgeb, & Wabnegger, 2015; Schienle, 2018).

In addition to using better samples and statistical methods than the SDS, the QASD is more accurate in terms of item settings. For the SDS, Overton et al. (2008) had formulated items pertaining to the construction of "behavior", "appearance" and "lack of self-esteem", and constructed four items for each of the constructs (k=12). In contrast to the SDS, the QASD contained twice as many items (k=26). Furthermore, items on the QASD contain positive and negative wording, which is the same with the SDS. Although the use of positive and negative item wording is often recommended in the literature (DeVellis, 1991; Podsakoff et al., 2003), some studies have argued that the combination of positive and negative item wording can affect the structural validity of self-report measures. For this reason, Schienle et al. (2014) used multitrait-multimethod confirmatory factor analytic methods to measure the detrimental effect of item wording on the construct validity in the QASD (Eid, 2000; Höfling et al., 2011).

2.5 Literature review summary

2.5.1 The importance of a precise measure of self-disgust

All aforementioned studies have focused on psychopathology and shown that self-disgust plays a critical role in mental disorders. Also, the internal relationship between self-disgust and mental disorders could provide a new direction for emotion research and its understanding, and treatment of mental disorders. Therefore, the precise measurement of self-disgust will be meaningful to better explore the clinical implications of self-disgust and understanding these relationships.

According to the above introduction of measurement of self-disgust, comparing the two existing self-disgust scales, the newly developed QASD is more accurate than the SDS in terms of factor construction, sample composition and item settings. Since the QASD has been shown to be a reliable tool for measuring the self-disgust in mental disorders (Clarke, Simpson & Varese, 2019; Ille et al., 2014; Schienle et al., 2014; Schienle et al., 2015; Schienle et al., 2018), we believe that the QASD must be adapted for application to Chinese patients in future research. Thus, in order to advance the clinical research of self-disgust in China, especially the relationship between self-disgust and other psychopathology, it is necessary to develop the QASD into China and test the reliability and validity of the Chinese version of the QASD among Chinese mental disorders. The Chinese version of the QASD would be a promising tool for the investigation of the psychological construct of self-disgust, and it could be useful to provide methods and theoretical basis for subsequent clinical research on the relationship between self-disgust and other psychological disorders.

2.5.2 Focusing on self-disgust is a new direction to improve patients' stoma care

Obviously, while colostomy is a life-saving procedure, it nonetheless destroys the integrity of the patient's body and threatens both physical and psychological functioning. How people overcome the challenges and successfully manage their stomas has been the focus of much research. According to the studies reviewed, stoma care has been a core issue for postoperative stoma (de la Encarnacion, 2019; Steinhagen, Colwell & Cannon, 2017). However, despite the best efforts of an increasing number of stoma therapists to improve the technique and quality of stoma care, the problems associated with stomas, such as common stoma complications, low quality of life, and severe psychological distress, have not decreased (Koc et al., 2017; Krishnamurty, Blatnik & Mutch, 2017). It is clear that the approach to patient care should be comprehensive, not only focusing on physical aspects, but also addressing other areas (e.g., spirituality, life status, and psychological distress; Capilla-Díaz et al.,

2019), and should account for factors such as the patient's emotional responses (e.g., self-disgust; Azlan et al., 2017b). Therefore, it is important to develop early, personalized, holistic pre- and postoperative care plans based on the aforementioned factors. On top of the current common stoma care (e.g., dietary advice and stoma care skills guidance; Burch, 2013; Burch, 2017), these emotion-based care plans and interventions may be a new direction for improving the stoma care.

2.5.3 Lack of measurement to specifically assess colostomy-specific disgust

Due to the particularity of the physiological structure and function of colostomy, as differentiated from the general trait disgust that is broad and heterogenous (Simpson et al., 2006), colostomy-specific disgust is featured with greater intensity and pertinence. Given that disgust is particularly relevant to mental health and considering the potential greater exposure to disgust-eliciting stimuli among colostomy patients, it is highly likely that the disgust experienced by an individual will be important for his or her mental health. Nevertheless, there has been a surprising oversight to date resulting in a lack of proper measurement tools for evaluating specific disgust among colostomy patients. As highlighted in a recent review by Reynolds et al. (2013), a comprehensive and thorough investigation of disgust may extend our understanding of the CRC trajectory and address the insufficient specialized tool to identify the potential disgusting stimuli (Chambers et al., 2016). In previous studies on disgust and CRC, the majority of researchers used the Disgust Scale-Revised (DS-R) (Reynolds, Consedine & McCambridge, 2014a; Reynolds, Consedine & McCambridge, 2014b). Due to the large number of items and dimensions, the DS-R-animal has been adopted as the operationalization of trait disgust in CRC contexts, mainly due to the relatively similar elicitors as animal disgust, such as bodily products and death. However, Olatunji et al. have pointed out that half of the items in DS-R are rated "True" or "False," and the term "Disgust" is not found on the items (Olatunji et al., 2007). Thus, it is difficult to confirm whether

these items actually measure disgust sensitivity as differentiated from other forms of aversion. Moreover, there is no report on the validation of the DS-R among CRC patients. Smith et al. (2007) have developed two items to measure colostomy-specific disgust in order to distinguish it from general trait disgust. However, these efforts remain insufficient to accurately reflect the disgust specifically related to colostomy. Therefore, it is necessary to establish and validate a colostomy disgust scale to assess the colostomy-specific disgust in colostomy patients.

3. Aims of study

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

3. Aims of study

The aims of this thesis are the examination of self-disgust and exploration of its role in mental health, including in mental disorders and colostomy patients, and the development of a special measurement to evaluate the specific disgust among colostomy patients. To achieve this purpose, we address the following specific aims:

1. To translate the questionnaire for the assessment of self-disgust (QASD) into Chinese and evaluate its validity and reliability among Chinese mental disorders.

2. To explore the relationship between stoma acceptance and stoma care self-efficacy in colostomy patients, and whether self-disgust and stigma play mediating roles in this relationship.

3. To establish and validate the psychometric properties of the Colostomy Disgust Scale (CDS) for assessing disgust in colostomy patients.

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

4. Hypothesis

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

4. Hypothesis

In the present study, we have the following hypotheses:

1. We expect that the Chinese version of the Questionnaire of Self-Disgust (QASD) would be a promising tool for investigation of psychological construct of self-disgust, and it could be useful to provide methods and theoretical basis for subsequent clinical research on the relationship between self-disgust and other psychological disorders.

2. We expect that the stoma acceptance would be positively related to stoma care self-efficacy and negatively related to self-disgust and stigma; Personal and/or behavioral self-disgust and/or stigma would negatively mediate the effect of stoma acceptance and stoma care self-efficacy.

3. We expected that the Colostomy Disgust Scale (CDS) has a good psychometric property to assess the colostomy-specific disgust in colostomy patients.

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
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5. Methods

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SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

5. Methods

To achieve the proposed objectives, we designed the following different methods in three studies:

5.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China

5.1.1 Design

This study was designed as a cross-sectional survey, as depicted in Figure 1, three phases were undertaken: a) Professional translation and expert panel review, b) Pre-testing, and c) Psychometric evaluation;

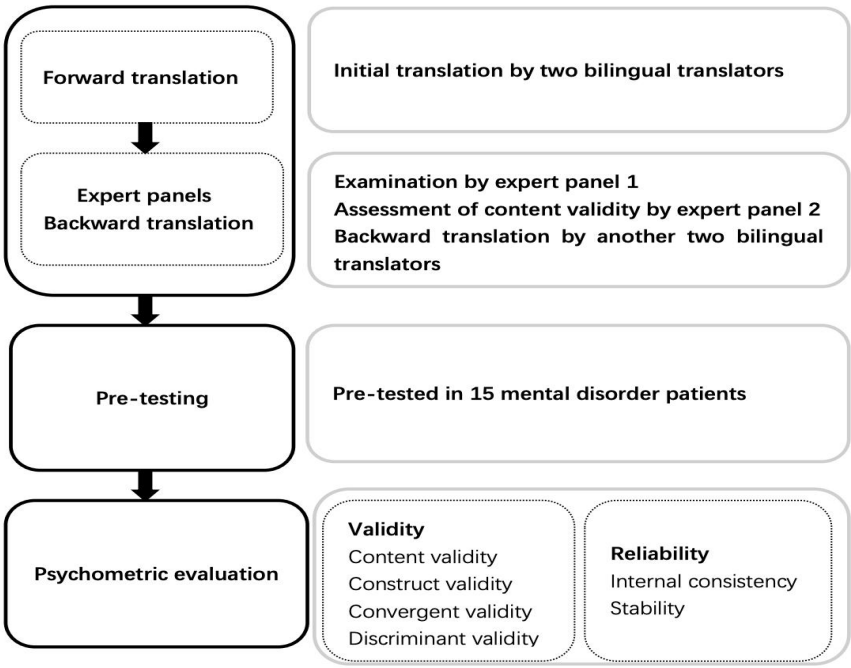

Figure 1 Flowchart depicting the process used for translation and validation of the instrument.

5.1.2 Study sample

Participants in study 1 were recruited from a psychiatric hospital in Tianjin, North China. The inclusion criteria were as follows: (1) age over 18 years; (2) ability to communicate; and (3) willingness to participate. The exclusion criteria were as follows: suffering from serious acute or chronic diseases, such as severe heart failure, liver disease, kidney failure, malignant tumor, etc.

5.1.3 Data collection procedure

The research team consists of a doctoral student as the leader and five master students as research assistants, all of whom have been systematically trained in the following two aspects: familiarization with research content and research methods; precautions during the data collection procedure, such as the unified use of guidance words and checking for missing values in the questionnaire. During the study period, 5 research assistants distributed questionnaires to patients, and checked whether there were missing items when the questionnaires were collected. Once the missing items were found, the corresponding patients were immediately asked to fill in.

5.1.4 Ethical approval and considerations

Ethical approval was obtained from the Ethics Committee of Tianjin University of Traditional Chinese Medicine. Prior to the study, the participants were informed of the objectives, significance, and principles of privacy protection. Each of the participants signed the informed consent form and had the right to drop out at any time during the study.

5.1.5 Measurement

Demographics and Clinical Information

Demographic and clinical information was obtained from the participants using a questionnaire designed by the researcher that yielded information about age, gender,

education, marital status, place of residence, financial status and mental disorder diagnosis.

The Questionnaire for the Assessment of Self-Disgust (QASD)

The QASD is a 14-item, self-reported measure for self-disgust that can be used in clinical and non-clinical samples (Schienle et al., 2014). It contains two subscales: "personal disgust", with nine items to assess the devaluation of one's own physical appearance and personality (e.g., "I find myself repulsive"), and "behavioural disgust", with five items that assess the devaluation of one's own behaviour (e.g., "I regret my behaviour"). All items are rated on a five-point Likert scale ("not true at all" to "absolutely true"). The total score reflects the standard of self-disgust, with high values indicating more self-disgust. In the original version of the study, the QASD showed good psychometric properties, and the subsequent studies also reported the strong internal consistency of the QASD ($\alpha = 0.850$, Schienle et al., 2015; $\alpha = 0.920$, Schienle et al., 2018).

Self Esteem Scale (SES)

The SES is a unidimensional measure of global feeling of self-worth (Rosenberg, Rosenberg & McCord, 1978). The scale contains 10 items and all items are rated on a four-point Likert scale ("Strongly agree" to "Strongly disagree"). The total score for self-esteem of individual is calculated by adding the responses of the 10 items. The internal consistency of the Chinese version of SES was $\alpha=0.850$ (Lin & Huang, 2010).

Trait Anger Scale (TAS)

The TAS is a 10-item scale that participants reported how angry they generally felt (Spielberger & Reheiser, 2003). All items are rated on a four-point Likert scale ("almost never" to "almost always"). The total score for angry of individual is calculated by adding the responses of the 10 items. The internal consistency of the Chinese version of TAS was $\alpha=0.760$ (Liu & Gao, 2012).

5.1.6 Statistical methods

IBM SPSS software Version 22.0 and Analysis of Moment Structure (AMOS) Version 17.0 were employed for data management and statistical analysis.First, descriptive statistics were used to describe the demographic characteristics of participants, including percentages, means and SDs.

Then, confirmatory factor analysis (CFA) was used as a critical step in refining the instrument and identifying the factorial structure of self-disgust in the QASD. We assessed the goodness of fit for model using various parameters, including Chi-square, the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root mean square of approximation (RMSEA). Then, the factor structure by conducting a one-factor model and bi-factor model to compare with the proposed model (e.g., a two-factor model) were examined. In addition, the measurement invariance across patients with heterogeneous mental health diagnoses was conducted by using multiple-group confirmatory factor analysis. Furthermore, convergent validity was measured by Pearson's correlation between the QASD and SES, and the discriminant validity was measured by Pearson's correlation between the QASD and TAS. Last, to evaluate internal consistency of the QASD, both Cronbach's alpha and Omega coefficients with a 95% confidence interval were measured.

5.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

5.2.1 Design

The study employed a cross-sectional survey design, with the STROBE guidelines used for this study.

5.2.2 Study sample

A convenience sample of colostomy patients who presented to the stoma clinic for check-ups in a tertiary hospital in Tianjin was chosen for the study. The eligibility criteria were patients who 1) had a diagnosis of CRC, and had been created a permanent stoma at least one month prior to the study; 2) were 18 years of age or older; 3) were able to speak and write Chinese; and 4) were willing to participate. The exclusion criteria included patients with a history of mental illness; other cancer metastases, or other serious physical illnesses.

5.2.3 Data collection procedure

The research team consisted of a doctoral student and three master students, all of whom had been systematically trained. Once written consent was secured, questionnaires were distributed to the patients. After the patients completed the questionnaire, answers were immediately checked by the researchers to ensure the questionnaires were completely filled out. If missing values were found, the questionnaire was returned to the patient so that he or she could fill in the missing items. A small gift was provided as a reward.

5.2.4 Ethical approval and considerations

The study was approved by the human research ethics committee of Tianjin People's Hospital (TPH No.2016-1067). Participants were provided with written and verbal information about the study, including the level of involvement required, the voluntary nature of participation, and the right to withdraw at any time.

5.2.5 Measurement

Stoma acceptance

We used the 8-item Acceptance of Illness Scale (AIS) to measure stoma acceptance (Felton, 1984). The Cronbach's alpha for the original version was 0.820,

and the Chinese version was 0.820 (Chiang et al., 2013). The ASI showed a good reliability in colostomy patients (Nowicki et al., 2015; Szpilewska et al., 2018). Because the AIS measures acceptance of illness in general, and in order to ensure patients focus on their stoma rather than on other pathologies, the word "illness" on the scale items was substituted by the word "stoma" in the study by Simmons et al. (2007). Based on the responses from their sample, the result showed that the internal consistency of the scale had improved (Cronbach's alpha was 0.900). Therefore, to accurately measure stoma acceptance, we also replaced the word "illness" with the word "stoma" in the scale items, and the measure showed adequate internal consistency estimate in our study (Cronbach's alpha was 0.893).

Self-disgust

We used the Questionnaire for the Assessment of Self-Disgust (QASD) to measure self-disgust (Schienle et al., 2014). It contains two subscales: "personal disgust", which has 9 items assess the devaluation of one's own physical appearance and personality, and "behavioural disgust", which has 5 items assess the devaluation of one's own behaviour. The Cronbach's alpha for the original version was 0.920, and the Chinese version was 0.895 (Jin et al., 2016). Due to the lack of tools specifically for self-disgust in cancer patients, researchers used the self-disgust scale (SDS; Overton et al., 2008) to measure the self-disgust caused by cancer (Azlan et al., 2017a; Azlan et al., 2017b). However, recent studies have shown that the newly developed QASD is more accurate than SDS in terms of factor construction, sample composition and item settings (Ille et al., 2014; Jin, Li, Gutiérrez-Colón & Jiménez-Herrera, 2020; Powell, Overton, & Simpson, 2014b; Schienle et al., 2014). Therefore, we used the QASD and to ensure the patients refer the items to the situation of stoma, we specifically marked the instruction at the beginning of the questionnaire "please focus on the feeling under the stoma rather than other diseases". In this study, the Cronbach's alpha for the personal disgust and behavioural disgust were 0.944 and

0.850, respectively.

Stigma

The stigma of the colostomy patients was measured using the 24-item Social Impact Scale (SIS), which has previously been used to examine stigma among patients with cancer (Fife & Wright, 2000). The Cronbach's alpha for the original version was 0.840 and the Chinese version tested in colostomy patients was 0.916 (Shen et al., 2017). In this study, the Cronbach's alpha was 0.926.

Stoma-related negative symptoms

After consulting two anorectal surgeons and combining relevant literature (Krishnamurty, Blatnik & Mutch, 2017), we listed the common stoma-related negative symptoms (unpleasant odour, stoma bag leakage, skin irritation, bleeding, diarrhea and constipation, retraction of stoma, fatigue, pain, partial necrosis, prolapse, parastomal hernia, stenosis and negative emotions related to stoma) and an item named 'others with a hyphen' (if the patient has more other symptoms which are not listed). The patients were asked to tick the stoma-related negative symptoms that they had experienced in the past weeks. The researchers calculated the number of negative symptoms for each patient based on the total number of ticks each patient gave.

Stoma care self-efficacy

We used the Stoma Self-Efficacy Scale to measure the self-Efficacy of stoma patients (Bekkers et al., 1996). It contains two subscales: the Stoma Care Self-Efficacy, which measures a person's perceived self-efficacy for stoma care, and the Social Self-Efficacy, which measures a person's perceived self-efficacy for social functioning in relation to the stoma. The correlation between the two subscales is 0.730, which may lead to unstable regression coefficients if the two subscales are used in the same analysis (Gordon, 1968). Therefore, Bekkers et al., (1996) suggested that the two subscales be used separately. Since our focus was on patients' stoma care ability, we used the 13-item Stoma Care Self-Efficacy. The Cronbach's alpha for the

original version of the Stoma Care SE was 0.940, the Chinese version was 0.970 (Wu et al., 2007). In this study, the Cronbach's alpha was 0.972.

5.2.6 Statistical methods

IBM SPSS Statistics version 24.0 was used to perform all data analysis. We calculated the percentages of participants in the various categories, means and SDs. Pearson correlation coefficients were calculated to explore the associations among variables. Finally, a mediation analysis was performed with Hayes's PROCESS macro in SPSS (Hayes, 2013) to explore the mediating effects. The mediating effect is assessed based on indirect effect of X (explanatory variable) on Y (response variable) through M (the mediators), which can be significant regardless of the significance of the total effect (the effect of X on Y) and the direct effect (the effect on Y when both X and M are included as predictors). In our test, the mediating effect was examined using the bootstrap method (5000 samples) with bias-corrected 95% confidence intervals (CIs). The Mediation effect is statistically significant if zero is not contained in the CI between the upper and lower bound.

5.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

5.3.1 Design

The study was designed as a triphasic, cross-sectional psychometric study, as depicted in Figure 2, three phases were undertaken: a) Item generation, b) Item selection, and c) Initial evaluation and validation.

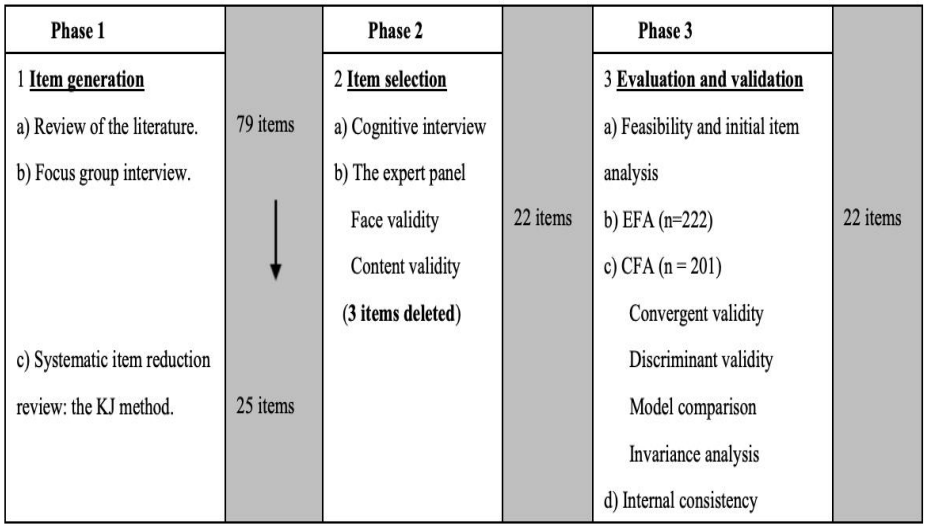

Figure 2 Phases of development of the CDS.

5.3.2 Study sample

The sample size was assessed according to the number of items in the CDS, which was multiplied by 5–10 as suggested by Polit et al. (2016). In the evaluation and validation phase, exploratory factor analysis (EFA) was applied to identify the main factors of the CDS. The preferred maximum sample size required for EFA was thus determined to be 220 patients. Confirmatory factor analysis (CFA) was applied to assess the coherence between the data and the structure. In this case, CFA was used to test the generality of the extracted factor from a separate sample of patients, for which we recruited a separate sample of 201 patients. two separate samples (N1 =222; N2 =201) were recruited from the colostomy patients who presented to the stoma clinic for regular check-up in a tertiary hospital in Tianjin. Eligibility criteria were (i) a confirmed diagnosis of colorectal cancer, had undergone colostomy treatment at least 1month before enrolment and regular stoma clinic attendance during the period of research; (ii) at least 18 years of age; (iii) be able to speak, read and write Chinese; and (iv) voluntary participation. Those patients with a history of mental health

problems, metastatic cancer and/or other severe physical disorders, such as heart attack and stroke, were excluded.

5.3.3 Data collection procedure

The research team consisted of a doctoral student as the leader and five master's degree students as research assistants, all of whom have been systematically trained in the following two aspects: familiarization with research content and research methods; precautions during the data collection procedure, such as the unified use of guidance words and checking for missing values in the questionnaire. The patients completed the study questionnaires while undergoing routine check-ups during stoma clinic visits in the ward. The questionnaire survey and data collection were completed by the 5 research assistants. Once written consent was secured, questionnaires were distributed to the patients. After the patients completed the questionnaire, answers were immediately checked by the research assistants to ensure that the questionnaires were completely filled out. If missing values were found, the questionnaire was returned to the patient so that he or she could fill in the missing items. Generally, patients completed the questionnaires in 5 to 8 minutes, and a small gift was provided as a reward.

5.3.4 Ethical approval and considerations

Ethical approval was obtained from the ethics committee of Tianjin People's Hospital. Both verbal and written information about this research, such as the voluntary nature of participation, the degree of involvement needed and the freedom to withdraw from participation at any time, were given to each participant. Written informed consent was obtained from all participants, and assurances of confidentiality were provided.

5.3.5 Measurement

Since this study is to establish and validate the psychometric properties of the Colostomy Disgust Scale (CDS), no measurements were involved.

5.3.6 Statistical methods

Data from the surveys were entered into the IBM SPSS Statistics version 20.0, R psych package and the IBM SPSS Amos version 22.0 for data management and statistical analysis. The psychometric properties of the CDS were evaluated using the following statistical approaches.

Firstly, feasibility was assessed by the CDS response rate, respondent's time of filling out the CDS, and data completion on the items of the questionnaire. The initial item analysis was assessed based on three aspects, and the item was removed if (i) floor and ceiling effect; (ii) corrected item-total correlations; and (iii) increased alpha upon item removal. Then, the predominant factors of CDS were identified through the Exploratory Factor Analysis (EFA) and the proposed two-factor solution of CDS was evaluated by confirmatory factor analysis (CFA) for the goodness-of-fit estimation on the actual data. Finally, to verify the internal consistency of CDS scale, the total scale and subscales were determined by Cronbach's alpha coefficient.

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

6. Results

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

6. Results

Based on different methods, we sorted and analyzed the data of the three studies, and obtained the results of the three studies as follows：

6.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China

6.1.1 Characteristics of the participants

During the study period (May 2016-January 2020), a total of 1100 questionnaires were sent out, and 1068 remained after the invalid questionnaires were removed, with no missing values. The 1068 participants were outpatients and inpatients at a psychiatric hospital. According to the diagnostic criteria (Chinese Classification of Mental Disorders, Third Edition, CCMD-3) of the clinical psychiatrist on the patients' medical record, the participants have the following diagnoses: moderate to major depression (n=210), eating disorders (n=221), schizophrenia (n=202), BPD (n=204), and anxiety (n=231). A total of 630 (58.99%) were male and 438 (41.01%) were female. The ages ranged from 18 to 57 years, with a mean age of 36.58±14.14 years. Table 1 provides the participants' descriptive characteristics. Subsequently, 29 patients received a second survey approximately two weeks after responding, to assess test-retest reliability of the QASD.

Table 1 Demographic characteristics of the samples in study 1

Variables	N =1068	%
Age (mean ± SD)	36.58±14.14	
Gender (n/%)		
Male	630	58.99
Female	438	41.01
Education (n/%)		

Primary and below	80	7.49
Junior high school	355	33.24
Senior high school	456	42.70
College and above	177	16.57
Marital status (n/%)		
Single	29	2.72
Married	951	89.04
Divorced	33	3.09
Widowed	55	5.15
Place of residence (n/%)		
City	958	89.70
Rural	110	10.30
Financial status (n/%)		
Poor	342	32.02
Fair	205	19.19
Good	376	35.21
Very good	145	13.58
Mental disorder diagnosis (n/%)		
Depression	210	19.66
Eating disorders	221	20.69
Schizophrenia	202	18.91
BPD	204	19.10
Anxiety	231	21.63

6.1.2 Validity

6.1.2.1 Content Validity

In our study, the Item-Level Content Validity Indices (I-CVI) ranged from .87 to 1.00, and the calculated Scale-Level Content Validity Index (S-CVI) was .99, indicating that the QASD content was valid.

6.1.2.2 Construct Validity

Figure 3 shows the results of factor structure and model fit of the QASD using CFA. Final fit statistics were all optimal, as it can be seen as follows: chi-square ($\chi 2$=92.427, *df* =76, $p < .001$), TLI=.995, CFI=.995, RMSEA=.010 (.001, .021). Accordingly, table 2 presents the fit indexes for model comparison. In accordance

with our hypothesis, the results showed that the chi-square difference test between the one-factor model and the two-factor model was significant (703.360, Δdf =1, p < .001). Also, the chi-square difference test between the bi-factor model and the two-factor model was significant (25.344, Δdf =13, p < .05). Thus, this indicated that the two-factor model had a significantly better fit than the one factor model and the bi-factor model.

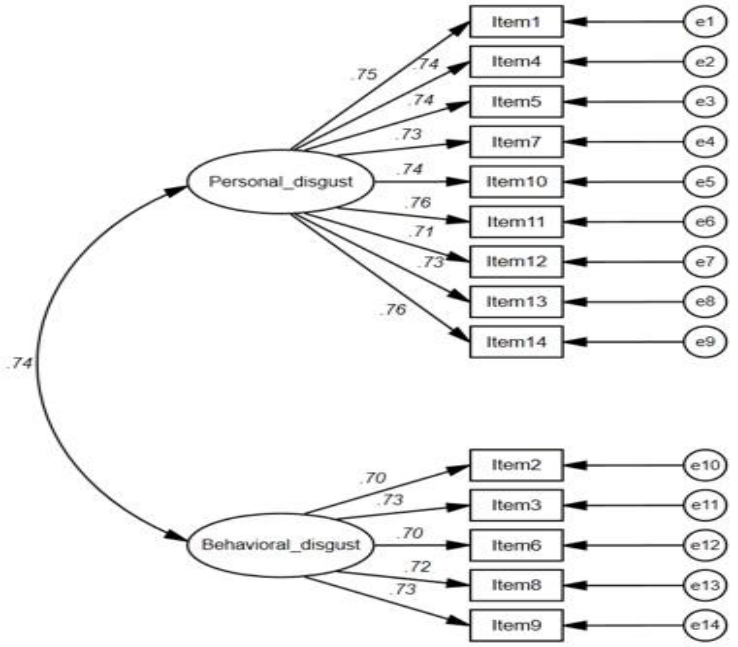

Figure 3 Factor structure of the refined model of the QASD

Furthermore, we evaluated whether the two-factor model generalizes across patients with heterogeneous mental health diagnoses (moderate to major depression: N=210; eating disorders: N=221; schizophrenia: N=202; BPD: N=204 and anxiety: N=231) using a multiple-group analysis. First, the configural invariance (i.e., the unconstrained multigroup) model was computed. Under this process, both factor loadings and intercepts were unconstrained, thus allowing to differ between groups.

The resulting model had an acceptable fit ($\chi2$= 387.056, *df* = 215, CFI = .970, TLI = .973, RMSEA = .053). The metric invariance (factor loadings fixed, intercepts free) resulted in the same fit indices as the configural invariance model ($\Delta\chi2$= 44.663, Δdf = 48, p = .610>.05). The scalar invariance (factor loadings fixed, intercepts fixed) resulted in the same fit indices as the metric invariance model ($\Delta\chi2$= 57.550, Δdf = 48, p = .163>.05). In the current findings, all measurement invariance models exhibited a good fit to the data. The final invariance model is a scalar invariance model, which crosses the patients with heterogeneous mental health diagnoses, indicating satisfactory psychometric properties for measurement invariance. (Table 2)

Table 2 Goodness-of-fit indexes of model comparison and invariance models (N=1068).

Model	χ2	*df*	CFI	TLI	RMSEA	Δχ2	Δ*df*	*P*
Model comparison								
Two-factor model	92.427	76	.995	.995	.010			
One-factor model	795.791	77	.911	.896	.097	703.360	1	***
Bi-factor model	67.803	63	.922	.906	.088	25.344	13	0.021
Measurement invariance								
Configural invariance	387.056	215	.970	.973	.053			
Metric invariance	431.719	167	.968	.969	.056	44.663	48	.610
Scalar invariance	489.269	119	.964	.969	.056	57.550	48	.163

Note. *p < .05; **p < .01; *** p < .001

6.1.2.3 Convergent validity

The convergent validity was assessed by the correlation of the QASD with the SES. The personal and the behavioral disgust showed a negative moderate correlation with the SES (r =-.60, p <.01; r=-.55, p <.01), indicating adequate concurrent validity of the QASD (Table 3).

6.1.2.4 Discriminant validity

The discriminant validity was assessed by the correlation of the QASD with the TAS. The personal and the behavioral disgust showed a low positive correlation with the TAS (r =.28, p <.01; r=.23, p <.01), indicating adequate divergent validity of the QASD. (Table 3)

Table 3 Correlation of the QASD with the SAS and TAS (N=1068).

Dimensionality	SAS	TAS
Personal disgust	-.60	.28
Behavioral disgust	-.55	.23

Note. QASD: Questionnaire for the Assessment of Self-disgust, SAS: Self Esteem Scale, TAS: Trait Anger Scale.

6.1.3 Reliability

6.1.3.1 Internal Consistency Reliability

The Cronbach's alpha of the personal and the behavioral disgust was .92 and .84, and the omega coefficient was .92 [.91, .92] and .84 [.83, .86], indicating that the QASD had a good internal homogeneity.

6.1.3.2 Stability

To evaluate the test-retest reliability, 29 patients from the current sample completed the QSAD twice, with a time interval of two weeks. The Intraclass Correlation Coefficient (ICC) for the personal and the behavioral disgust was .62 and .77, indicating that the QSAD has moderate stability over time.

6.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

6.2.1 Characteristics of the participants

From January 2016 to March 2017, 485 patients were approached and nine refused to take part. Therefore, 476 patients took part and provided assessable data. The age of the respondents ranged from 45 to 81. More than half (54.62%, n = 260) of the participants were female, and 97.48% (n = 464) were married. 49.58% (n = 236) had stoma complications, 43.70% (n = 208) had retained their stomas for three months to one year, and the majority (76.87%, n=359) had a sigmoid colostomy. The demographics of the samples are reported in Table 4.

Table 4 Demographic characteristics of the samples in study 2

Variable	N =476	%
Age [Mean (SD)]	60.95(7.38)	
Gender		
Male	216	45.38
Female	260	54.62
Level of Education		
Primary or below	32	6.72
Junior high school	158	33.19
Senior high school	204	42.86
College and above	82	17.23
Marital status		
Single	12	2.52
Married	430	90.34
Divorced	11	2.31
Widowed	23	4.83
Place of residence		
City	436	91.60
Rural	11	8.40
Living status		
With others	457	96.01
Alone	19	3.99

Monthly income (yuan)		
< 3000	134	28.15
3001 to 5000	276	57.98
> 5000	66	13.87
Family history of colorectal cancer		
Yes	26	5.46
No	450	94.54
Complications of stoma		
Yes	236	49.58
No	240	50.42
Duration of stoma implantation		
< 3 months	76	15.97
3 months to one year	208	43.70
> one year	192	40.33
Stoma type		
Sigmoid colostomy	400	84.03
Descending colostomy	6	1.26
Ileum colostomy	70	14.71

6.2.2 Descriptive and reliability

The means, SDs, and Cronbach's alpha coefficients for our composite variables are presented in Table 5. All our composite variables demonstrated acceptable levels of internal reliability.

Table 5 Descriptive statistics and reliability among all variables

Variable	Mean	SD	Cronbach's alpha
Stoma-related negative symptom	3.006	0.525	
Stoma acceptance	2.891	0.525	0.893
Stigma	2.455	0.357	0.926
Personal disgust	3.029	0.619	0.944
Behavioural disgust	3.076	0.561	0.850
Stoma care self-efficacy	2.894	0.582	0.972

6.2.3 Correlation analysis

The results of the Pearson's correlation analyses are displayed in Table 6. The results revealed that gender showed only negative and low associations with stoma care self-efficacy. Stoma-related negative symptoms and duration of stoma implantation were not significantly related to the other variables. Stoma acceptance was significantly and negatively associated with personal disgust, behavioural disgust, and stigma. Contrarily, it was significantly and positively associated with stoma care self-efficacy. Stigma was significantly and positively associated with personal disgust and behavioural disgust. Finally, stoma care self-efficacy was significantly and negatively associated with personal disgust, behavioural disgust, and stigma.

Table 6 Correlations among all variables

	1	2	3	4	5	6	7	8
1. Gender	1	-0.047	-0.040	0.059	0.002	-0.025	-.094*	-0.047
2. Stoma-related negative symptom		1	-0.004	-0.024	0.010	0.001	-0.019	-0.080
3. Duration of stoma implantation			1	-0.067	-0.015	0.058	0.021	-0.012
4. Stoma acceptance				1	-.309***	-.640***	-.384***	.689***
5. Stigma					1	.200***	.127***	-.441***
6. Personal disgust						1	.611**	-.761***
7. Behavioural disgust							1	-.453***
8. Stoma care self-efficacy								1

Note. *p < .05; **p < .01; *** p < .001.

6.2.4 Mediation analysis

As depicted in Figure 4, we examined whether the relationship between stoma acceptance (X) and stoma care self-efficacy (Y) was mediated by self-disgust (M1: personal disgust; M2: behavioural disgust) and stigma (M2). Table 7 shows the unstandardized regression coefficients (B) with the standard errors (SEs) and CIs (in parentheses), to estimate self-disgust and stigma (mediators), and stoma care self-efficacy. We used the PROCESS macro V3.4 and mediation model 4 (parallel mediation) to analyse the indirect effect, assuming that personal disgust, behavioural disgust and stigma were parallel. First, the total effect of stoma acceptance on stoma care self-efficacy showed that a one-unit increase in the stoma acceptance score was associated with an average 0.76-unit increase in the stoma care self-efficacy score (95% CI [0.69, 0.83]). Personal disgust and stigma were also significantly associated with stoma care elf-efficacy. In particular, a one-unit increase in the personal disgust score was associated with a -0.52-unit increase (95% CI [-0.59, -0.45]) in the stoma care self-efficacy score, and a one-unit increase in the stigma score led to a -0.40-unit increase (95% CI [-0.48, -0.32]) in the stoma care self-efficacy score. Behavioural disgust was not significantly associated with stoma care self-efficacy. The results showed that the total indirect effect of stoma acceptance on stoma care self-efficacy through personal disgust, behavioural disgust and stigma was 0.47 (95% CI [0.41, 0.55]), from which the indirect effect of stoma acceptance on stoma care self-efficacy through personal disgust was 0.40 (95% CI [0.33, 0.47]) and through stigma was 0.08 (95% CI [0.06, 0.12]). The CIs for these indirect effects did not include zero, suggesting significant indirect effects through personal disgust and stigma mediators. The indirect effect of stoma acceptance on stoma care self-efficacy through behavioural disgust was -0.01 (95% CI [-0.04, 0.02]). The CIs for this indirect effect included zero, suggesting non-significant indirect effects through behavioural disgust. There was a significant effect of sex on stoma care self-efficacy as a covariate, and

the CIs did not include zero (-0.08, 95% CI [-0.16, -0.01]). There was a significant effect of stoma-related negative symptoms on stoma care self-efficacy as a covariate, and the CIs did not include zero (-0.07, 95% CI [-0.13, -0.01]). There was no significant effect of duration of stoma implantation on stoma care self-efficacy as a covariate, and the CIs include zero (0.03, 95% CI [-0.01, 0.07]). The mediating effect of personal disgust was significantly higher than that of stigma (0.31, 95% CI [0.24, 0.39]).

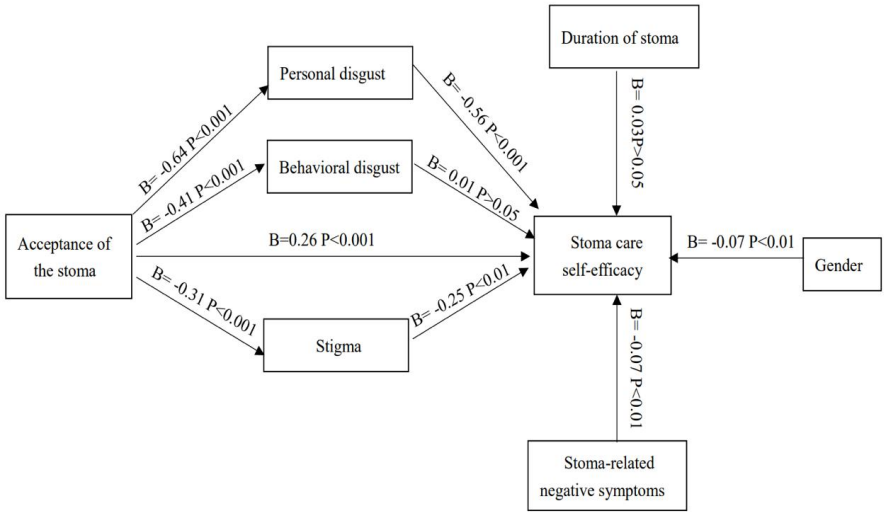

Figure 4 Graphic representation of the mediation model (N = 476).

Table 7 The unstandardized regression coefficients(B) with standard errors (SE) and 95% confidence intervals (CI) (in parentheses) estimating personal disgust, behavioural disgust and stigma (M) and stoma care self-efficacy(Y).

	M1A			M1B			M2			Y		
	B	SE	95%CI	B	SE	95%CI	B	SE	95%CI	B	SE	95%CI
Constant	5.250	0.187	[4.882,5.618]	4.392	0.204	[3.992,4.793]	3.077	0.134	[2.814,3.339]	4.785	0.243	[4.309,5.262]
X	-0.757	0.042	[-0.839, -0.674]	-0.414	0.046	[-0.503, -0.324]	-0.211	0.030	[-0.270, -0.152]	0.288	0.037	[0.216,0.360]
G	-0.030	0.044	[-0.116,0.057]	-0.047	0.048	[-0.141,0.047]	0.033	0.031	[-0.029,0.095]	-0.522	0.035	[-0.591, -0.453]
S	-0.015	0.037	[-0.087,0.057]	-0.028	0.040	[-0.106,0.050]	0.003	0.026	[-0.048,0.054]	0.014	0.032	[-0.049,0.078]
D	0.013	0.031	[-0.048,0.073]	-0.005	0.034	[-0.071,0.062]	-0.017	0.022	[-0.061,0.026]	-0.401	0.042	[-0.484, -0.318]
M1A										-0.082	0.029	[-0.139, -0.026]
M1B										-0.071	0.024	[-0.118, -0.024]
M2										0.026	0.020	[-0.014,0.066]
R2	0.411			0.150			0.099			0.717		
F-ratio	(4,471) 82.229 p<0.001			(4,471) 20.813 p<0.001			(4,471)12.950 p<0.001			(7,468) 169.050 p<0.001		

Note. X= Stoma acceptance; G=Gender; S= Stoma-related negative symptom; D=Duration of stoma implantation; M1A= Personal disgust; M1B = Behavioural disgust; M2= Stigma; Y= Stoma care self-efficacy. Effects are significant when the upper and lower bound of the bias corrected 95% confidence intervals (CI) does not contain zero

6.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

6.3.1 Characteristics of the participants

During January 2015 to April 2016, two separate samples were recruited in this study. A total of 222 patients with colostomy were involved in the EFA, with a mean age of 61.31 (SD = 7.48). The majority of the participants (58.10%, n=129) were male. A total of 202 patients with colostomy were involved in the CFA. Table 8 summarizes the descriptive characteristics of participants in both EFA and CFA.

Table 8 Demographic characteristics of the samples in study 3.

Variable	EFA sample (N =222) Number (%)	CFA sample (N =201) Number (%)
Age (mean ± SD)	61.31±7.48	60.60±7.45
Gender		
Male	129 (58.10)	122 (60.70)
Female	93 (41.90)	79 (39.30)
Education		
Primary or below	16(7.20)	17(8.50)
Junior high school	73(32.90)	69(34.30)
Senior high school	94(42.30)	85(42.30)
College and above	39(17.60)	30(14.90)
Marital status		
Single	6(2.70)	5(2.50)
Married	200(90.10)	177(88.10)
Divorced	5(2.30)	9(4.50)
Widowed	11(4.9)	10(4.90)
Occupational Level		
Employed	43(19.40)	34(16.90)
Retired	161(72.50)	152(75.60)
Unemployed	18(8.10)	15(7.50)
Living status		

With others	213(95.90)	192(95.50)
Alone	9(4.10)	9(4.50)
Monthly income (yuan)		
< 3000	111(50)	100(49.70)
3001 to 5000	79(35.60)	72(35.80)
> 5000	32(14.40)	29(14.40)
Family history of colorectal cancer		
Yes	12(5.40)	15(7.50)
No	210(94.60)	186(92.50)
Complications of stoma		
Yes	113(50.90)	99(49.30)
No	109(49.10)	102(50.70)
Duration of stoma implantation		
< 3 months	60(27)	58(28.90)
3 months to one year	126(56.80)	117(58.20)
> one year	36(16.20)	26(12.90)
Stoma type		
Sigmoid colostomy	210(94.60)	191(95)
Descending colostomy	2(0.90)	2(1)
Ileum colostomy	10(4.50)	8(4)

6.3.2 Feasibility and initial item analysis

The gross response rate for the CDS was 100%, with no missing values, and the vast majority of the responses fell within the score range of two to four. Overall, the time for filling out was on an average of 7.8 minutes (SD =5.1). All items exhibited no floor and ceiling effect (< 0.30), the corrected item-total correlation value was >0.30, and the alpha value did not increase if any item was deleted (Table 9).

Table 9 22-Item of CDS (N=222)

Item	Factor	Floor effect	Ceiling effect	Corrected Item-Total Correlation	Cronbach's alpha if Item Deleted	Factor Loadings		Eigenvalue	Variance
						Factor1	Factor2		
Item1	Factor1	0	0.02	0.71	0.94	0.69	0.02	7.55	34.32%
Item2		0.02	0	0.71	0.93	0.65	0.06		
Item3		0.01	0.02	0.75	0.93	0.67	0.06		
Item4		0.01	0.01	0.73	0.93	0.67	0.06		
Item5		0.04	0.01	0.73	0.93	0.73	0.07		
Item6		0.03	0.01	0.73	0.93	0.70	-0.04		
Item7		0.02	0.01	0.70	0.94	0.70	-0.01		
Item8		0.05	0.05	0.74	0.93	0.78	-0.01		
Item9		0	0.04	0.73	0.93	0.70	0.01		
Item10		0.02	0.02	0.69	0.94	0.75	-0.09		
Item11		0.03	0.04	0.72	0.93	0.75	-0.10		
Item12		0.03	0.01	0.73	0.93	0.75	0.01		
Item13		0.06	0	0.63	0.94	0.72	-0.02		
Item14	Factor2	0	0.04	0.68	0.91	-0.06	0.76	3.99	18.13%
Item15		0.03	0.01	0.71	0.90	-0.07	0.75		
Item16		0.03	0.05	0.70	0.90	0.08	0.73		
Item17		0.01	0.02	0.70	0.90	0.05	0.73		
Item18		0.01	0	0.68	0.91	0.03	0.70		
Item19		0.02	0.05	0.68	0.91	0.03	0.75		
Item20		0.03	0.04	0.71	0.90	-0.04	0.81		
Item21		0.01	0	0.76	0.90	0.08	0.67		
Item22		0	0.05	0.70	0.90	-0.07	0.72		

6.3.3 EFA

The underlying factor structure of the 22-item scale was assessed by PAF. The KMO measure was .946, and Bartlett's test result was significant (χ^2 = 2182.974, p < 0.001), thus demonstrating the adequacy of the sample for the EFA. Through oblique rotation, a two-factor solution was extracted (with eigenvalues > 1), and the two factors accounted for a total of 52.47% of the explained variance, with factor loadings of ≥0.40 for all items on their respective factors. Factor 1 was described as "core disgust", which accounted 34.32% of the total variance and had an eigenvalue of 7.55. It was composed of 13 items with factor loadings ranging from 0.65 to 0.78. Factor 2 was described as "interpersonal disgust", which measured 18.15% of the total variance and had an eigenvalue of 3.99. This factor had nine items with factor loadings ranging from 0.67 to 0.81. The results above indicated that the factor loadings of CDS are good. The items and loadings are shown in Table 10.

6.3.4 CFA

Figure 5 shows the CFA results of the factor structure and model fit of CDS. Final fit statistics were all acceptable: chi-square (χ2 = 226.284, *df* =208, p < 0.001), CFI = 0.99, TLI =0.99, and RMSEA = 0.02.

The convergent validity of the CDS was examined by CFA as well as AVE and CR. The results showed that the factor loadings of all items ranged from 0.65 to 0.81, the AVE values were 0.55 and 0.54, and the CR values were 0.94 and 0.92. As described earlier, all the criteria displayed good acceptability, supporting the idea that the proposed CDS has satisfactory discriminant validity (Table 10).

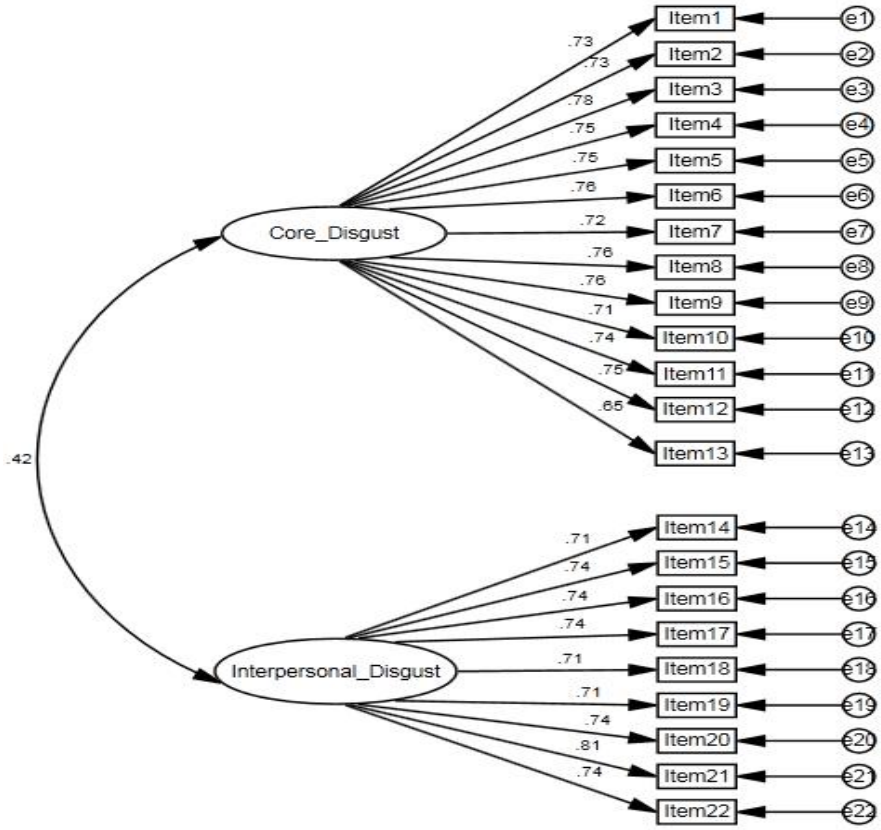

Figure 5 Factor structure of the refined model of the CDS

Table 10 Factor structures by confirmatory factor analysis (N=201)

Items	Factor	Standardized Estimate	P	CR	AVE
Item1	Core Disgust	0.73	<.001	0.94	0.55
Item2		0.73	<.001		
Item3		0.78	<.001		
Item4		0.75	<.001		
Item5		0.75	<.001		
Item6		0.76	<.001		
Item7		0.72	<.001		
Item8		0.76	<.001		
Item9		0.76	<.001		
Item10		0.71	<.001		
Item11		0.74	<.001		
Item12		0.75	<.001		
Item13		0.65	<.001		
Item14	Interpersonal Disgust	0.71	<.001	0.92	0.54
Item15		0.74	<.001		
Item16		0.74	<.001		
Item17		0.74	<.001		
Item18		0.71	<.001		
Item19		0.71	<.001		
Item20		0.74	<.001		
Item21		0.81	<.001		
Item22		0.74	<.001		

Note. CR=composite reliability; AVE=average variance

Furthermore, a one-factor model and a bi-factor model were compared with the two-factor model. Table 11 presents the fit indexes for model comparison. To our expectation, the results demonstrated that the chi-square difference test between the one-factor model and the two-factor model was significant (728.64, Δdf =1, $p < 0.001$), and the chi-square difference test between bi-factor model and two-factor model was significant (36.28, Δdf =21, $p < 0.05$), which indicated that the two-factor model had a significantly better fit than the one-factor model and the bi-factor model.

Additionally, we conducted a multiple-group analysis to examine the

measurement invariance across genders among colostomy patients (male, n = 122; female, n = 79). As shown in Table 12, all measurement invariance models exhibited a

moderate fit to the data, and the final invariance model represent a scalar invariance model across genders among colostomy patients. This result indicates the acceptable psychometric properties of the CDS for assessing the measurement invariance.

Table 11 Model comparison for confirmatory factor analysis (N=201)

Model	$\chi 2$	*df*	CFI	TLI	RMSEA	$\Delta\chi 2$	Δdf	P
Two-factor model	226.284	208	.993	.992	.021			
One-factor model	954.921	209	.688	.666	.133	728.640	1	<.001
Bi-factor model	190.003	187	.923	.923	.031	36.281	21	0.020

Table 12 Model fit of various invariance models (N=201)

Model	$\chi 2$	*df*	CFI	TLI	RMSEA	$\Delta\chi 2$	Δdf	P
1.Configural invariance	428.915	416	.995	.994	.018			
2.Metric invariance	454.000	436	.993	.992	.020	25.085	20	0.198
3.Scalar invariance	479.935	456	.990	.990	.023	51.020	40	0.114

6.3.5 Internal consistency

To determine the internal consistency, the values of Cronbach's alpha were calculated individually for the subscales of the CDS. The Cronbach's alpha of the core disgust and the interpersonal disgust was 0.94 and 0.91, indicating that the proposed CDS has a good internal consistency (Table 13). The content of the 22-item CDS is shown in Table 14.

Table 13 Factor score, correlation and Cronbach's α of the CDS (N=201)

Variable	M (SD) Range	Core Disgust r(p)	Interpersonal Disgust r(p)	Cronbach's α
Core Disgust	39.79 (7.99) (18-61)	1		0.94
Interpersonal Disgust	29.32(5.68) (16-46)	0.39**	1	0.91

Note. *p < .05; **p < .01; *** p < .001.

Table 14 The 22-item CDS

Item
1. The stoma on my body makes me feel sick.
2. I admit that the stoma has caused me a lot of trouble.
3. I am tired of my stoma, as it makes me feel my body is incomplete.
4. The decision to make a stoma makes me feel some degree of regret.
5. I still can't stand the fact that there is a stoma on my body.
6. This stoma makes me feel that I am no longer a normal person.
7. I try to avoid looking at the stoma.
8. When I change my stoma bag, the faeces I encounter makes me feel disgusted.
9. Compared with my normal anus, the stoma bag needs frequent replacement and cleaning, which makes me upset.
10. The smell of faeces emanating from the stoma of the intestine disgusts me.
11. The cost of the stoma bag annoys me.
12. When I see my faeces being excreted from time to time and I can't control it, I feel irritable.
13. I am afraid to eat or deliberately eat less food to avoid faecal discharge.
14. I think people will feel uncomfortable once they know about my stoma.
15. I think I will not be affirmed by others as before because of my stoma.
16. My stoma makes me ashamed in front of strangers.
17. My stoma makes me embarrassed at a friend's party.
18. I avoid going out to dinner because of the stoma.
19. When others mention the topic of the stoma, I have some concerns.
20. I will feel humiliated if people around me smell the faeces from the stoma.
21. I am afraid that others will know about my stoma.
22. I think others will dislike me because of this stoma.

6.4 Summary of main results

In study 1, multi-group confirmatory factor analysis (CFA) supported the two-factor structure of the original QASD construct. Measurement invariance showed that the QASD is invariant across the patients with heterogeneous mental health diagnoses. The correlation of QASD with the Self-Esteem Scale (SES) and the Trait Anger Scale (TAS) showed that it has good convergent and discriminative validity. Internal consistency and test-retest yielded acceptable results. Thus, the findings suggest that the Chinese version of the QASD is a reliable and valid instrument with adequate psychometric properties for assessment of self-disgust among patients with mental disorders in China.

In study 2, stoma acceptance was significantly and negatively associated with personal disgust (r = −.640, p<.001), behavioral disgust (r = −.384, p<.001), and stigma (r = −.309, p<.001). Also, it was significantly and positively associated with stoma care self-efficacy (r = .689, p<.001). Furthermore, regression-based mediation modelling showed that personal disgust and stigma had significant mediating effects on stoma acceptance and stoma care self-efficacy.

In study 3, 79 items were obtained from both the literature review and the focus group interview. It is to be noticed that the scale was reduced to 25 items after performing the KJ method. Three items were removed following the recommendations of experts, resulting in a 22-item scale. Principal axis factoring indicated a two-factor solution for the proposed CDS model, which was also verified by confirmatory factor analysis. Moreover, the proposed CDS had a high internal consistency. Overall, the findings revealed excellent factorial reliability and validity for the 22-item CDS.

7. Discussion

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

7. Discussion

In this section, we analyzed and explained the important results of the three studies respectively, the discussion of the three studies are presented below：

7.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China

Assessment of the translated instrument's reliability and validity revealed acceptable outcomes, which confirmed that the QASD has good psychometric properties. As shown in the results, the Chinese QASD Cronbach's alpha was consistent with the result in the Austria study (0.92) (Schienle, 2018). However, the Cronbach's alpha of the subscales "personal disgust" (0.92) and "behavioral disgust" (0.84) found in this research was slightly different from the study by Ille et al. (2014) (0.79, 0.91). We speculate that, among other reasons, the subtle variations of internal consistency in ours and previous studies could be due to differences in sample size and the clinical characteristics of the study subjects. Given the consensus in the psychometric literature that Cronbach's alpha is rarely appropriate, and given the good performance of omega when the assumptions of alpha are not met, it is recommended that omega be calculated along with CIs for each subscale comprising the test (Dunn, Baguley & Brunsden, 2014). Since there was no difference in the results of alpha and omega of the subscale, this suggested that the evidence of good internal consistency in the QSAD is sufficient. In addition, the results showed moderate test-retest reliability, hence, our findings indicated that the QASD is stable for two weeks.

Regarding the construct of self-disgust, Powell et al. (2015a) raised a model of problematic and enduring self-disgust as a distinct emotion schema. They described self-disgust as a lasting disgust-based cognitive-affective orientation towards the self, composed of interacting state and higher-order trait components. The construct of self-disgust has also been treated both as a negative personality trait (Olatunji, David & Ciesielski, 2012) and a distinct self-conscious emotion (Roberts & Goldenberg, 2007). Yet, despite these previous theoretical results, the self-disgust construct itself remains

particularly ambiguous (Powell, Overton & Simpson, 2014a). Even so, the two-factor structure of self-disgust is persuasive in the QSAD and the SDS. As it had been predicted, our study revealed that the Chinese version of the QASD comprises two dimensions of self-disgust: "personal disgust" and "behavioral disgust." These perfectly fits the two-factor model proposed by the original authors. Generally, the two factors of the QSAD were consistent with those of the SDS: the "disgusting self," concerned with enduring context-independent aspects of the self, and the "disgusting ways," concerned with behavior (Overton et al., 2008). Moreover, similar factors have been obtained from studies of self-criticism: "hated self" and "inadequate self" (Gilbert et al., 2004). This finding reveals that the experience of self-disgust may at times include some kind of self-criticism, which is consistent with the results of Simpson et al. (2010). The evidence of recent correlations suggests that self-disgust may share some commonality with self-directed negative cognitions (Overton et al., 2008; Simpson et al., 2010). It is likely that the self-disgust is somewhat an indicator of other negative self-directed constructs (e.g., self-criticism, self-hatred). Powell et al. (2014b) pointed out that a minority of items in the SDS include vocabularies such as hate and dislike, which are likely to tap into additional constructs. However, these vocabularies about negative self-conscious emotion also appeared on the QASD scale, which is something that needs to be taken into account.

To further identify the factorial structure of the QASD, we examined the factor structure by conducting a one-factor model and bi-factor model to compare with the two-factor model. The results showed that the two-factor structure model of the QASD is convincing and worthy of promotion. Previous research has shown that different psychiatric disorders investigated differed from each other regarding the severity of dysfunctional self-perception and the associated psychopathologic symptoms. For example, patients afflicted with BPD and patients with eating disorders reported the most elevated personal disgust. Personal disgust was predictive of psychoticism and depression, while behavioral disgust was predictive of anxiety (Azlan et al., 2017a; Ille et al., 2014; Powell, Simpson & Overton, 2013). Therefore, in order to determine whether the two-factor structure of the QASD is stable in different psychiatric samples, we evaluated the extent to which the two-factor structure can be replicated across patients with heterogeneous mental health diagnoses. The findings indicated that the QASD has the same structure and meaning across patients with heterogeneous mental

health diagnoses. These results provided important additional information on the potential utility of the QASD for different groups of mental disorders.

The negative moderate correlation between the self-disgust and the self-esteem was consistent with the study of Simpson et al. (2010) (r=-.67), which implied that the structure of self-disgust and self-esteem are supposed to be similar, to some extent. That is to say, as two extremes of cognition and emotion in the structure of self, self-disgust and self-esteem constructs a continuum from negative to positive (Johnson & Wood, 2017). The low correlation between the self-disgust and trait anger showed that both belong to negative emotions, but they are not much related. This result suggested that, although self-disgust has both cognitive and emotional components, it is more specifically a self-concept of how one feels disgusted towards oneself.

In addition, the two personal disgust and behavioral disgust factors were moderately correlated with each other (r=.68), which was higher than the result of the original scale (r=.48; Schienle et al., 2014). This implied that the two trait facets of self-disgust are partially independent from each other and, therefore, they may be differentially related to other trait factors as well as to specific psychopathologies. For example, hostility and psychoticism were the best predictors for personal disgust, while interpersonal sensitivity and anxiety predicted behavioral disgust (Ille et al., 2014). Therefore, further research should continue to focus on these interesting associations concerning different aspects of self-disgust and their potential relationship with other trait factors in mental disorders.

7.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

In this paper, we explored the relationship between stoma acceptance, self-disgust, stigma, and stoma care self-efficacy in colostomy patients. Our first prediction: (1) stoma acceptance would be positively related to stoma care self-efficacy and negatively related to self-disgust and stigma, was supported. This result mirrors the results found in previous studies with colostomy patients showing that stoma acceptance was related to self-efficacy and stigma (Simmons, Smith, Bobb & Liles, 2007; Yuan, Zhang, Zheng & Bu, 2018). The correlation between stoma acceptance and self-disgust was confirmed for the first time in this study, and it supports acceptance as a predictor of patients' emotional disorders and psychological well-being (Kotsou, Leys & Fossion, 2018). There are at least two reasons why stoma acceptance may be especially associated with

self-disgust, stigma, and self-efficacy. First, people with higher self-acceptance are less fearful of public discrimination and rejection (Kilic, Taycan, Belli & Ozmen, 2007). A positive perception of one's own situation helps reduce negative emotions and aversive self-conscious feelings (Kotsou, Leys & Fossion, 2018). Second, the reconstruction of self-worth leads to a positive coping style (Ferrin, Fong, Chronister & Chiu, 2010), leading to more control over the colostomy and better stoma management. Besides, in our study, gender was associated with stoma care self-efficacy. This finding is in accordance with Wu et al. (2007), but is not consistent with the result of Mystakidou et al. (2010). The correlation between gender and self-efficacy revealed in our study may be due to the social and family roles of men that determine the strength and confidence of stoma control. Nevertheless, considering the opposing views, the association between gender and issues related to stoma still seems a complexity and entails further investigation. Furthermore, it should be noted that contrary to our expectations, duration of stoma implantation and stoma-related negative symptoms were not related to other variable, although some literature indicated that most stoma-related problems occur within the first 3 months and the complications would affect the quality of life (Kwiatt & Kawata, 2013; Sarkar, 2018; Thorpe, Arthur & McArthur, 2016). In our study, most patients' duration of stoma were more than 6 months, self-acceptance and management might increase as patients have repeated experiences with the stoma, resulting in no significant difference between the two variables and other variables. We speculate that the severity of symptoms may be a better indicator than the number of symptoms, which needs our further verification in future research.

Predictions (2) and (3) were supported by the mediation model. Personal disgust and stigma had significant mediating effects on stoma acceptance and stoma care self-efficacy. Patients with lower stoma acceptance had higher self-disgust and higher levels of perceived stigmatization—they appeared to assume that others would be disgusted by their colostomies. The two factors were strong negative predictors of stoma care self-efficacy in turn. This finding is consistent with the idea that acceptance is a central factor in the onset and maintenance of emotional disorders (Kotsou, Leys & Fossion, 2018). Patients who do not accept stomas could exacerbate negative perception, resulting in aversive self-conscious feelings, and therefore are more likely to perceive public discrimination. Besides, psychological states (especially positive emotional factors) have been associated with the ability to successfully reconstitute meaning in life

(Ong et al., 2006; Johnson Vickberg et al., 2001), such as a greater sense of mastery (self-efficacy; Hao et al., 2020), optimism (Yang et al., 2018) and self-esteem (Izydorczyk et al., 2018). Given the effect of emotional adjustment on coping styles (e.g., disgust tends to elicit the avoidance or rejection; Powell, Simpson & Overton, 2013), it is not surprising that patients who experience internal disgust and perceived external stigma due to the stoma reported lower levels of stoma care self-efficacy. The evidence of the relationship between the above four variables could encourage stoma therapists and clinical nurses to consider emotional factors like self-disgust and stigma when aiming to improve stoma self-care and management.

Prediction (3) was partially supported. We have observed that behavioural disgust had no mediating effect on stoma acceptance and stoma care self-efficacy, and the mediating effect of personal disgust was larger than that of stigma. We speculated that, based on the particularities of colostomy, such as problems with body products (e.g., faeces), impaired self-image, poor hygiene (e.g., unpleasant odour), and sickness, colostomy patients would regard their environments or even themselves as a source of contamination; such personal disgust, rather than behavioural disgust, is typically the basis of self-disgust. In addition, we expected that perceived stigmatization by others would increase the patients' self-disgust. The finding that personal disgust had a greater effect than behavioural disgust on colostomy patients was consistent with a study with limb amputees (Burden et al., 2018). The main reason is that for this type of patients, the primary change to the self is physical rather than one's character or behavioral standards. These findings suggest that it is important to distinguish between personal disgust and behavioural disgust when investigating the relationship between self-disgust and mental health. It also reminds the stoma nurses to focus on the patient's disgust directed towards their own physical appearance and personality when formulating the care plans and interventions.

7.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

In this work, the CDS were established and validated for assessing colostomy-specific disgust. After reviewing previous literature on the disgust in colostomy, we noted that no standardized tool has been specifically designed to identify the triggers of disgust in CRC contexts, as well as in colostomy. Thus, we constructed a simple and easy-to-use 22-item scale to examine colostomy-specific disgust.

The computed PAF followed by CFA indicated a two-factor solution corresponding to the two subscales: core disgust and interpersonal disgust. These factors were relatively consistent with those constructed from previous findings (Olatunji et al., 2005; Olatunji et al., 2006; Rozin, Haidt & McCauley, 2008), supporting a high content validity of the newly developed measures. The results of convergent validity and discriminant validity tests also confirmed that the construct validity of the CDS is good. To further identify the factorial structure of the CDS, we examined the factor structure by conducting a one-factor model and a bi-factor model to compare with the two-factor model. The results showed that the two-factor structural model of the CDS is convincing and worthy of promotion. Finally, we evaluated the extent to which the two-factor structure can be replicated across gender among colostomy patients and found that the structure is highly stable. These results provided important additional information on the broad potential utility of the CDS for patients with colostomy.

With regards to the two factors of the CDS, core disgust is interpreted as an internal cause of disgust mainly towards the physiological changes triggered by disease, while interpersonal disgust is an external cause of disgust that is perceived from the outside due to the profound physical changes. Notably, these two factors were found to be moderately correlated with each other in our study. This finding implies that the two trait facets of colostomy-specific disgust are partially independent and thus may be differentially related to other trait factors as well as to certain psychological stress responses.

The elicitors of core disgust are recognized as the most salient and common disgust-provoking objects to date (Rozin, Haidt & McCauley, 2008). Core disgust has been accurately considered as deriving from stimuli containing a likelihood of pathogen transmission. Poor hygiene, bodily excretions (e.g., faeces and blood), damage to the bodily envelope (e.g., wounds and deformities) and death have all been reported as the main sources of this response (Berle & Phillips, 2006). Therefore, being a “diseased” or “contaminating” object (Neal et al., 2007), sickness and nausea (Carey & Burish, 1988), bowel issues (Bauer et al., 2009), physical alterations resulted from surgery (Bredin, 1999), negative smells, and the awareness of their own mortality and death (Goldenberg, Arndt, Hart & Routledge, 2008) are all stimuli that elicit colostomy-specific disgust that colostomy patients must tackle. As opposed to core disgust, interpersonal disgust is

generally experienced as disgust and avoidance from outside. In other words, individuals with this type of disgust often consider themselves a repulsive person (Powell, Overton & Simpson, 2014a). Fundamentally, disgust has an intimate link with one's bodily dissatisfaction and appearance concerns (Griffiths & Page, 2008; Park, Schaller & Crandall, 2007). The profound physical changes engendered by colostomy may result in disgust reactions with a stronger influence on social function, particularly through the increased perceived discrimination and worsening of social isolation (Griffiths & Page, 2008).

In view of the comments on the DS–R by Olatunji et al. (2007), a 5-point Likert-type scale (1 = strongly disagree; 5= strongly agree) was adopted, which can maximize the variability within the answers and measure colostomy-specific disgust in colostomy patients. Furthermore, multiple emotions phrasing was rated in the CDS, such as humiliate and dislike (Olatunji et al., 2007). More importantly, the CDS was developed and tested in patients with colostomy, which could produce more accurate results for the measurement of colostomy-specific disgust.

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

8. Limitation and future implications

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

8. Limitation and future implications

Although the results of the present work had several strengths, some limitations must be addressed to indicate several avenues for future research.

For study 1, first, according to the newly criteria for good content validity of a patient-reported outcome measure, content validity is formed of item relevance, appropriateness of response options and recall period, comprehensiveness and comprehensibility (Terwee et al., 2018). In our study, we just test the comprehensibility and item relevance, which only reflect some degree of content validity. For that, we suggest that a fuller investigation of content validity is warranted. Second, we gathered the sample exclusively in the urban area of Tianjin and, thus, the results might not be generalizable to other locations in China; a larger and more diverse sample is needed in future research. Besides, due to limitations in time and finance, we could not provide face-to-face instructions during the process of completing the questionnaire, which might have resulted in a higher response rate. Therefore, an alternative method of collecting the data may be needed in the future.

For study 2, the first limitation of the research is that it relied entirely on participants' self-report measures, which may be biased and thus influencing our results. Especially for measuring stoma-related negative symptoms, although we listed as many stoma-related negatives symptoms as possible and made the final code based on the judgment of clinical staff, all the results still depend on participants' self-report, which may weaken their validity and accuracy and reduce the generalizability of the findings. Additionally, since self-disgust may share commonalities with self-directed negative emotions (Simpson, Hillman, Crawford & Overton, 2010), it is difficult to determine whether the self-disgust as measured in this study includes other emotions, such as self-criticism and self-hatred. These aspects should be considered in future studies, as they may influence the findings. Finally, the model tested in this study was limited, as it is likely that other variables (e.g., optimism, social support, or body dissatisfaction) may be involved in the relationships between stoma acceptance, self-disgust, stigma and stoma care self-efficiency. Due to time constraints and collaboration issues, we were unable to exhaust all potential confounders in our study. Therefore, a more rigorous research design should be adopted to actively exclude or control confounding variables including randomization, restriction and matching (Pourhoseingholi, Baghestani &

Vahedi, 2012). Future research could include observational and intervention studies to investigate the causality among these variables.

For study 3, the first limitation is that we integrated or deleted some items in the phase of item generation in our study, which may raise concerns about the comprehensiveness of the scale. Moreover, we tested only comprehensibility and item relevance, which only reflects a certain degree of content validity. To enhance this approach, we suggest that a fuller investigation of content validity is warranted. Second, in terms of the validation method, we did not perform concurrent reliability and test-retest reliability testing. Hence, future investigation should include comparisons of the existing disgust measures to provide additional evidence for the construct validity of the CDS.

9. Relevance and applicability

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

9. Relevance and applicability

The three studies have guiding significance for clinical theory and practice, the relevance and applicability of the three studies are presented below：

9.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China

Given the self-disgust is increasingly used in clinical mental health, an adequate tool to effectively measure it is of great significance. Firstly, bridging the gap of previous researches, the present study is the first one to test the reliability and validity of the Chinese version of the QASD among Chinese mental disorders. In addition, the study findings provide future researchers and clinicians with information of necessary steps to evaluate psychometric properties of QASD. Furthermore, our study has the value of offering evidence that the QASD is a promising tool for further investigation of the role of self-disgust in mental health problems.

9.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

The findings from this study have implications for understanding the impact of psychological factors on stoma self-efficacy in colostomy patients and contribute to the literature on the importance of addressing emotional factors in self-management. This work suggests that a reluctance for stoma acceptance may have particularly adverse effect on stoma care self-efficacy through increases in self-disgust and stigma. There are two potential points for intervention. First, before a colostomy, expected stoma acceptance can be measured by stoma therapists and clinical nurses to determine which patients may particularly suffer as a result of the stoma to be able to monitor and treat them accordingly. There is evidence that acceptance is a central trans-diagnostic process that explains a large proportion of variance in mood disorders and is associated with coping and emotion regulation strategies. Therefore, improving the acceptance abilities of patients may be a promising intervention for promoting psychological and physical

health. Second, reducing self-disgust and stigma may be a useful strategy for improving a patient's ability to manage the stoma. Recent experimental work has shown that dispositional mindfulness encourages people to pay more attention to the present moment, which inspires them to redefine the meanings of disaster, life and the self and establish more trust in their own strength. However, research on the effective regulation and treatment of self-disgust and stigma is still in its infancy, and there are plentiful opportunities for future work in this field. At the clinical level, our results suggest that regardless of the type of intervention, it is essential that emotional components (e.g., acceptance, disgust and stigma) are the main focuses of clinical intervention.

9.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

Given the particular nature of colostomy, the colostomy-specific disgust is featured with greater intensity and pertinence than general trait disgust, and its close relationship with health (for example, disgust predicts greater stigma, lower adjustment, and poorer life satisfaction) plays an important role in colostomy context. The newly established and validated scale can be used to evaluate the colostomy-specific disgust experienced by patients with colostomy. In addition, this CDS can be valuable for the identification of colostomy patients with a high level of disgust, in order to facilitate the medical care personnel to take corresponding measures, including psychological counselling and emotive therapy, etc. The findings of this study also has potential use for future research and practice. For instance, the proposed CDS may be used to inform the evaluation of novel therapies and to help drive the development of ameliorative interventions for the enhancement of the quality of life among colostomy patients.

10. Conclusion

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

10. Conclusion

This section presents the main findings and directions of the studies, the following are the conclusions of the three studies:

10.1 Study 1: Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China

In study 1, our findings suggest that the QASD Chinese version is a reliable and valid instrument with adequate psychometric properties to assess self-disgust. Furthermore, our study has the value of offering evidence that the QASD is a promising tool for further investigation of the role of self-disgust in mental health problems. Specifically, the two facets, personal and behavioural disgust, can be investigated together with other facets of mental health problems in clinical groups to explore potential relationships.

10.2 Study 2: Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

In study 2, the current study was the first to quantitatively explore the effects of stoma acceptance, self-disgust, and stigma on stoma care self-efficacy. The findings showed that the colostomy patients with lower stoma acceptance exhibited lower levels of self-efficacy. Moreover, the association could be explained entirely by increases in self-disgust and stigma. Although we have focused on colostomy, this association may also be related to other physical health conditions, such as incontinence and amputation. Altogether, these findings highlight the importance of emotional factors in stoma self-efficacy. They suggest that interventions that target emotion may be useful in improving the ability of self-management ability of colostomy patients, which may provide a new direction for stoma therapists in colostomy care.

10.3 Study 3: Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patients with Colostomy

In the study 3, we developed a 22-item self-reported questionnaire to assess the colostomy-specific disgust experienced by patients with colostomy. This initial evaluation shows that the CDS has a robust psychometric profile, suggesting that the scale is worthy of promotion and use in clinical settings. Continued examination of the

scale, including psychometric testing on large samples, content validity, test-retest reliability and the MIC (minimal important change) value, represents important avenues for future work.

Reference

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
Yanfei Jin

Reference

Abdul-Hamid, S., Denman, C., & Dudas, R. B. (2014). Self-Relevant Disgust and Self-Harm Urges in Patients with Borderline Personality Disorder and Depression: A Pilot Study with a Newly Designed Psychological Challenge. *PLOS ONE, 9*(6), e99696.
doi:10.1371/journal.pone.0099696

Amir, N., Najmi, S., Bomyea, J., & Burns, M. (2010). Disgust and Anger in Social Anxiety. *International Journal of Cognitive Therapy, 3*(1), 3-10.

Azlan, H. A., Overton, P. G., Simpson, J., & Powell, P. A. (2017a). Differential. Disgust Responding in People with Cancer and Implications for Psychological Wellbeing. *Psychology & Health, 32*(1), 19-37. doi.org/10.1080/0887044 6.2016.123 5165

Azlan, H.A., Overton, P.G., Simpson, J., & Powell, P.A. (2017b). Effect of Partners' Disgust Responses on Psychological Wellbeing in Cancer Patients. *Journal of Clinical Psychology in Medical Settings, 24*, 355-364. doi.org/10.1007/s10880-017-9521-z

Barrett, K. C., Zahn-waxler, C., & Cole, P. M. (1993). Avoiders vs. Amenders: Implications for the investigation of guilt and shame during Toddlerhood? *Cognition and Emotion, 7*(6), 481-505. doi:10.1080/02699939308409201

Bauer, R. M., Bastian, P. J., Gozzi, C., & Stief, C. G. (2009). Postprostatectomy. Incontinence: All About Diagnosis and Management. *European Urology, 55*(2), 322-333. doi.org/10.1016/j.eururo.2008.10.029

Bekkers, M. J. T. M., Van Knippenberg, F. C. E., Van Den Borne, H. W., & Van Berge-Henegouwen, G. P. (1996). Prospective Evaluation of Psychosocial Adaption to Stoma Surgery: The Role of Self-Efficacy. *Psychosomatic Medicine, 58*(2).

Berle, D., & Phillips, E. S. (2006). Disgust and Obsessive–Compulsive Disorder: An. Update. *Psychiatry: Interpersonal and Biological Processes, 69*(3), 228-238. doi.org/10.1521/psyc.2006.69.3.228

Brake, C. A., Rojas, S. M., Badour, C. L., Dutton, C. E., & Feldner, M. T. (2017). Self-disgust as a potential mechanism underlying the association between PTSD and suicide risk. *Journal of Anxiety Disorders, 47*, 1-9. doi.org/10.1016/j.jan xdis.201 7.01.003

Burch, J. (2013). Care of patients with a stoma. *Nurs Stand, 27*(32), 49-56; quiz 58. doi.org/10.7748/ns2013.04.27.32.49.e7347

Burch, J. (2017). Care of patients undergoing stoma formation: what the nurse needs to know. *Nurs Stand, 31*(41), 40-45. doi.org/10.7748/ns.2017.e10177

Burden, N., Simpson, J., Murray, C., Overton, P. G., & Powell, P. A. (2018). Prosthesis Use is Associated with Reduced Physical Self-disgust in Limb Amputees. *Body Image, 27*, 109-117. doi.org/10.1016/j.bodyim.2018.08.001

Bredin, M. (1999). Mastectomy, body image and therapeutic massage: a qualitative. study of women's experience. *Journal of Advanced Nursing, 29*(5),1113-1120. doi.org/10.1046/j.1365-2648.1999.00989.x

Capilla-Díaz, C., Bonill-de las Nieves, C., Hernández-Zambrano, S. M., Montoya-Juárez, R., Morales-Asencio, J. M., Pérez-Marfil, M. N., & Hueso-Montoro, C. (2019). Living With an Intestinal Stoma: A Qualitative Systematic Review. *Qualitative Health Research, 29*(9), 1255-1265. doi.org/10.1177/1049732318820933

Carey, M. P., & Burish, T. G. (1988). Etiology and treatment of the psychological side effects associated with cancer chemotherapy: A critical review and discussion. *Psychological Bulletin, 104*(3), 307-325. doi.org/10.1037/0033 2909.104.3.307

Chambers, J., O'Carroll, R. E., Brownlee, L. A., Libby, G., & Steele, R. (2016). Colorectal Cancer Screening and Perceived Disdust: The Importance of the Ick Factor

in Faecal Occult Blood Test Uptake. *Colorectal Cancer: Open Access, 2*(1), 1-8. doi.org/10.21767/2471-9943.100013

Chiang, X., Lai, N., Livenh, H., Ye, M. & Cai, Z. (2013). Validity and Reliability of Chinese Version of Acceptance of Disability Scale-Revised. *Tzu Chi Nursing Journal,12*(1):66-76. (In Chinese)

Clarke, A., Simpson, J., & Varese, F. (2019). A systematic review of the clinical utility of the concept of self-disgust. *Clinical Psychology & Psychotherapy, 26*(1), 110-134. doi:10.1002/cpp.2335

Curtis, V., Aunger, R., & Rabie, T. (2004). Evidence that disgust evolved to protect from risk of disease. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 271(*suppl_4), S131-S133. doi:10.1098/rsbl.2003.0144

Davey, G. C. (1994). Self-reported fears to common indigenous animals in an adult UK population: the role of disgust sensitivity. *British Journal of Psychology, 85*(4), 541-54.

de Jong, P. J., & Borg, C. (2015). Contemporary models of sexual behavior propose that sexual responses involve sexual inhibitory. In P.A. Powell, P.G. Overton, & J.Simpson (Eds.), The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust (pp. 89-112). London: Karnac.

de la Encarnacion, O. C. (2019). Impact on quality of life and importance of stoma care in patients with ostomy complications. *Revista Rol De Enfermeria, 42*(4), 60-63.

Dunn, T. J., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology, 105*(3), 399-412. doi:10.1111/bjop.12046

DeVellis, R. F. (1991). Scale development: Theory and applications. *Newbury. Park*, CA: Sage.

Eid,M. (2000).A multitrait-multimethod model with minimal assumptions. *Psychometrika, 65*, 241–261. doi.org/10.1007/BF02294377

Ekman, P. (1999). Basic emotions. In T. Dalgleish & M.J. Power (Eds.), Handbook of cognition and emotion (pp. 45-60). New York, NY: John Wiley & Sons.

Ekman, P. (1999). Basic emotions. In T. Dalgleish & M.J. Power (Eds.), Handbook of cognition and emotion (pp. 45-60). New York, NY: John Wiley & Sons.

Espeset, E. M. S., Gulliksen, K. S., Nordbø, R. H. S., Skårderud, F., & Holte, A. (2012). The Link Between Negative Emotions and Eating Disorder Behaviour in Patients with Anorexia Nervosa. *European Eating Disorders Review, 20*(6), 451-460. doi:10.1002/erv.2183

Felton e.a. (1984). Accepance of Illness Scale. In Measures in Health Psychology, Berkshire.

Ferrin, J. M., Fong, C., Chronister, J., & Chiu, C.-Y. (2010). Psychometric validation of the Multidimensional Acceptance of Loss Scale. *Clinical Rehabilitation, 25*(2), 166-174. doi.org/10.1177/0269215510380836

Fife, B. L., & Wright, E. R. (2000). The Dimensionality of Stigma: A Comparison of Its Impact on the Self of Persons with HIV/AIDS and Cancer. *Journal of Health and Social Behavior*, *41*(1), 50-67. doi.org/10.2307/2676360

Gilbert, P., Clarke, M., Hempel, S., Miles, J. N. V., & Irons, C. (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *British Journal of Clinical Psychology, 43*(1), 31-50. doi:10.1348/0144665047728 12959

Gilbert, P. (2005). Compassion: Conceptualizations, research and use in. *psychotherapy*. Routledge.

Gilbert, P. (2015). Self-Disgust, Self-Hatred and Compassion Focused Therapy. In Powell, P. A., Overton, P.G., & Simpson, J. (eds) The revolting self: Perspectives

on the Psychological, Social, and Clinical Implications of Self-Directed Disgust. Karnac Books, London.

Goldenberg, J. L., Arndt, J., Hart, J., & Routledge, C. (2008). Uncovering an. existential barrier to breast self-exam behavior. *Journal of Experimental Social Psychology, 44*(2), 260274. doi.org/10.1016/j.jesp.2007.05.002

Gordon, R. A. (1968). Issues in Multiple Regression. *American Journal of Sociology, 73*(5), 592-616. doi.org/10.1086/224533

Griffiths, L. J., & Page, A. S. (2008). The Impact of Weight-related Victimization on. Peer Relationships: The Female Adolescent Perspective. *Obesity, 16*(S2), S39-S45. doi.org/10.1038/oby.2008.449

Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to. disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences, 16*(5), 701-713. doi.org/10.1016/01918869(94)90212-7

Hao, Y.-J., Sun, H.-B., Li, H.-W., Chen, B.-J., Chen, X.-L., Ma, L., & Li, Y.-L. (2020). Application of Positive Behavior Management in Patients after Breast Cancer Surgery. *World journal of clinical cases, 8*(4), 689-699. doi.org/10.12998/ wjcc.v 8.i4.689

Höfling, V., Moosbrugger, H., Schermelleh-Engel, K., & Heidenreich, T. (2011). Mindfulness or Mindlessness? *European Journal of Psychological Assessment, 27*(1), 59-64. doi:10.1027/1015-5759/a000045

Ille, R., Schöggl, H., Kapfhammer, H.-P., Arendasy, M., Sommer, M., & Schienle, A. (2014). Self-disgust in mental disorders — symptom-related or disorder-specific? *Comprehensive Psychiatry, 55*(4), 938-943. doi.org/10.1016/j.comppsych.2013.12.020

Izydorczyk, B., Kwapniewska, A., Lizinczyk, S., & Sitnik-Warchulska, K. (2018). Psychological Resilience as a Protective Factor for the Body Image in Post-

Mastectomy Women with Breast Cancer. *International Journal of Environmental Research and Public Health, 15*(6). doi.org/10.3390/ijerph15061181

Jin, Y., Xiong, L., Gao, F., & Jin, C. (2016). Validity and Reliability of Chinese Version of Questionnaire for the Assessment of Self-Disgust. *Journal of Nursing Science, 31*(03):80-83. (In Chinese)

Jin, Y., Li, Y., Gutiérrez-Colón, M., & Jiménez-Herrera, M. (2020). Questionnaire for the Assessment of Self-Disgust (QASD): The Psychometric Testing among Mental Disorders in China. *Clinical Psychology & Psychotherapy, n/a*(n/a). doi:10.1002/cp p.2459

Johnson Vickberg, S. M., Duhamel, K. N., Smith, M. Y., Manne, S. L., Winkel, G., Papadopoulos, E. B., & Redd, W. H. (2001). Global Meaning and Psychological Adjus tment among Survivors of Bone Marrow Transplant. *Psycho-Oncology, 10*(1), 29-39. doi.org/10.1002/10991611(200101/02)10:1<29::AID-PON482>3.0.CO;2-Y

Johnson, J. & Wood, A.M. (2017). Integrating Positive and Clinical. Psychology: Viewing Human Functioning as Continua from Positive to Negative Can Benefit Clinical Assessment, Interventions and Understandings of Resilience. *Cognitive Therapy & Research, 41*(3): 335-406. doi.org/10.1007/s10608-015-9728-y

Kilic, E., Taycan, O., Belli, A. K., & Ozmen, M. (2007). The Effect of Permanent Ostomy on Body Image, Self-esteem, Marital Adjustment, and Sexual Functioning. *Turk Psikiyatri Derg, 18*(4), 302-310.

Koc, U., Karaman, K., Gomceli, I., Dalgic, T., Ozer, I., Ulas, M., & Akoglu, M. (2017). A Retrospective Analysis of Factors Affecting Early Stoma Complications. *Ostomy/wound management, 63*(1), 28-32.

Kotsou, I., Leys, C., & Fossion, P. (2018). Acceptance Alone Is a Better Predictor of Psychopathology and Well-being than Emotional Competence, Emotion Regulation and Mindfulness. *Journal of Affective Disorders, 226*, 142-145. doi.org/10.1016/j.jad.2017.09.047

Krishnamurty, D. M., Blatnik, J., & Mutch, M. (2017). Stoma Complications. *Clinics in colon and rectal surgery, 30*(3), 193–200. doi.org/10.1055/s-0037-1598160

Kwiatt, M., & Kawata, M. (2013). Avoidance and Management of Stomal Complications. *Clinics in Colon and Rectal Surgery, 26*(2), 112-121. doi.org/10.1055 /s-0033-1348050

Lin, X., & Huang, Z. (2010). Re-discussion of the Chinese version of the Rosenberg Self Esteem Scale Item 8. *Chinese Journal of School Doctor,24*(4):263-265. (In Chinese)

Liu, H., &Gao, H. (2012). Reliability and validity of the Chinese version of. State-Trait Anger Expression Inventory-2 in college students. *Chinese Mental Health Journal,26*(1):70-76. (In Chinese)

Mystakidou, K., Tsilika, E., Parpa, E., Gogou, P., Theodorakis, P., & Vlahos, L. (2010). Self-efficacy Beliefs and Levels of Anxiety in Advanced Cancer Patients. *European Journal of Cancer Care, 19*(2), 205-211. doi.org/10.1111/j.1365-2354.200 8.01039.x

Neal, C., Beckjord, E. B., Rechis, R., Schaeffer, J., Berno, D., & Duchover, Y. (2007). Cancer stigma and silence around the world: A LIVESTRONG report, (Eds.), *TX:* LIVESTRONG Foundation, Austin.

Nowicki, A., Marciniak, J., Farbicka, P., & Banaszkiewicz, Z. (2015). Satisfaction with Life and Disease Acceptance By Patients with a Stomy Related to Surgical Treatment of the Rectal Cancer--Determinants of Quality of Life? *Polski przeglad chirurgiczny, 87*(9), 434-442. doi.org/10.1515/pjs-2015-0085

Olatunji, B. O., Williams, N. L., Lohr, J. M., & Sawchuk, C. N. (2005). The structure of. disgust: domain specificity in relation to contamination ideation and excessive washing. *Behaviour Research and Therapy, 43*(8), 1069-1086. doi.org/10.10 16/j.brat.2004.08.002.

Olatunji, B. O., Sawchuk, C. N., de Jong, P. J., & Lohr, J. M. (2006). The

structural relation between disgust sensitivity and blood–injection–injury fears: A cross-cultural comparison of US and Dutch data. *Journal of Behavior Therapy and Experimental Psychiatry, 37*(1), 16-29. doi.org/10.1016/j.jbtep.2005.09.002

Olatunji, B. O., David, B., & Ciesielski, B. G. (2012). Who am I to judge? Self-disgust predicts less punishment of severe transgressions. *Emotion, 12*(1), 169-173. doi:10.1037/a0024074

Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The Disgust Scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment, 19*(3), 281-297. doi:10.103 7/1040-3590.19.3.281

Olatunji, B. O., Cox, R., & Kim, E. H. (2015). Self-Disgust Mediates the Associations Between Shame and Symptoms of Bulimia and Obsessive-Compulsive Disorder. *Journal of Social and Clinical Psychology, 34*(3), 239-258. doi:10.1521/js cp.2015.34.3.239

Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological Resilience, Positive Emotions, and Successful Adaptation to Stress in Later Life. *Journal of Personality and Social Psychology, 91*(4), 730-749. doi.org/10.1 037/0022-3514.91.4.730

Overton, P. G., Markland, F. E., Taggart, H. S., Bagshaw, G. L., & Simpson, J. (2008). Self-disgust mediates the relationship between dysfunctional cognitions and depressive symptomatology. *Emotion, 8*, 379–385. doi:10.1037/1528-3542.8.3.379

Palmeira, L., Pinto-Gouveia, J., & Cunha, M. (2017). The role of self-disgust in eating psychopathology in overweight and obesity: Can self-compassion be useful? *Journal of Health Psychology,10*:780-790. doi.org/10.1177/1359105317702212

Park, J. H., Schaller, M., & Crandall, C. S. (2007). Pathogen-avoidance mechanisms. and the stigmatization of obese people. *Evolution and Human Behavior, 28*(6), 410-414. doi.org/10.1016/j.evolhumbehav.2007.05.008

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology, 88*(5), 879-903. doi.org/10.1037/0021-9010.88.5.879

Pourhoseingholi, M. A., Baghestani, A. R., & Vahedi, M. (2012). How to Control Confounding Effects by Statistical Analysis. *Gastroenterology and Hepatology from Bed to Bench, 5*(2), 79-83.

Power, M. J., &Dalgleish, T. (1997). Cognition and emotion: From order to disorder. Psychology Press, *3rd ed.* United Kingdom, UK: Tybur, J. M., Lieberman.

Powell, P.A., Simpson, J., & Overton, P.G. (2013). When disgust leads to. dysphoria: a threewave longitudinal study assessing the temporal relationship between self-disgust and depressive symptoms. *Cognition and Emotion, 27*(5), 900-913. doi:1 0.1080/02699931.2013.767223

Powell, P. A., Overton, P. G., & Simpson, J. (2014a). The Revolting Self: An. Interpretative Phenomenological Analysis of the Experience of Self-Disgust in Females with Depressive Symptoms. *Journal of Clinical Psychology, 70*(6), 562-578. doi:10. 1002/jclp.22049

Powell, P.A., Overton, P.G., & Simpson, J. (2014b). An introduction to the. revolting self: Self-disgust as an emotion schema. In P.A. Powell, P.G. Overton, & J. Simpson (Eds.), The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust. London, England: Karnac Books.

Powell, P.A., Simpson, J., & Overton, P.G. (2015a). An introduction to the revolting self: self-disgust as an emotion schema. In P.A. Powell, P.G. Overton, & J. Simpson (Eds.), The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust (pp. 1-24). London: Karnac.

Powell, P. A., Simpson, J., & Overton, P. G. (2015b). Reflections on the revolting self: A commentary and further directions. In P. A. Powell, P.G. Overton, &

J. Simpson (Eds.), The revolting self: Perspectives on the psychological, social, and clinical implications of self‐directed. disgust (pp. 243–255). London: Karnac.

Powell, P. A., Azlan, H. A., Simpson, J., & Overton, P. G. (2016). The effect of disgust-related side-effects on symptoms of depression and anxiety in people treated for cancer: a moderated mediation model. *Journal of Behavioral Medicine, 39*(4), 560-573.
doi:10.1007/s10865-016-9731-0

Reynolds, L. M., Consedine, N. S., Pizarro, D. A., & Bissett, I. P. (2013). Disgust and Behavioral Avoidance in Colorectal Cancer Screening and Treatment: A Systematic Review and Research Agenda. *Cancer Nursing, 36*(2), 122–130.
doi:10.1097/NCC. 0b013e31826a4b1b

Reynolds, L. M., Consedine, N. S., & McCambridge, S. A. (2014a). Mindfulness and. Disgust in Colorectal Cancer Scenarios: Non-judging and Non-reacting Components Predict Avoidance When It Makes Sense. *Mindfulness, 5*(4), 442-452.
doi:10.1007/s12671-0130200-3

Reynolds, L. M., Consedine, N. S., & McCambridge, S. A. (2014b). Mindfulness and. Disgust in Colorectal Cancer Scenarios: Non-judging and Non-reacting Components Predict Avoidance When It Makes Sense. *Mindfulness, 5*(4), 442-452.
doi:10.1007/s12671-0130200-3

Reynolds, L. M., Bissett, I. P., & Consedine, N. S. (2015). Predicting the patients who will struggle with anal incontinence: sensitivity to disgust matters. *Colorectal Disease, 17*(1), 73-80. doi:10.1111/codi.12781

Reynolds, L. M., Bissett, I. P., & Consedine, N. S. (2018). Emotional predictors of. bowel screening: the avoidance-promoting role of fear, embarrassment, and disgust. *BMC Cancer, 18*(1), 518. doi:10.1186/s12885-0184423-5

Roberts, T. A., & Goldenberg, J. L. (2007). Wrestling with nature: An. existential perspective on the body and gender in self-conscious emotions. In J. L.

Tracy,R.W.R obins,&J. P. Tangney (Eds.), The self-conscious emotions: theory and research (pp. 389–406). New York: Guildford.

Rozin, P., Haidt, J., & McCauley, C. R. (2000). Disgust. In M. Lewis & J. M. Haviland-Jones (Eds.), Handbook of emotions (2nd ed., pp. 637–653). New York: Guilford Press.

Rozin, P., Haidt, J., & McCauley, C. R. (2008). Disgust. In Handbook of emotions, 3rd ed. (pp. 757-776). New York, NY, US: The Guilford Press.

Rosenberg, F.R., Rosenberg, M., & McCord, J. (1978). Self-esteem and. delinquency. *Journal of Youthand Adolescence, 7*, 279-7. doi.org/10.1007/BF01537978

Rüsch, N., Schulz, D., Valerius, G., Steil, R., Bohus, M., & Schmahl, Ch. (2010). Disgust and implicit self-concept in women with borderline personality disorder and posttraumatic stress disorder. *European Archives of Psychiatry and Clinical Neuroscience, 261*,369–376. doi.org/10.1007/s00406-010-0174-2

Sawchuk, C.N. (2009). Acquisition and maintenance of disgust: Developmental and learning perspectives. In: B. O. Olatunji & D. Mckay (Eds.), Disgust and its Disorders: Theory, Assessmnet, and Treatment Implication (pp. 77-97). Washington DC.

Schaller, M., & Park, J. H. (2011). The Behavioral Immune System (and Why It Matters). *Current Directions in Psychological Science, 20*(2), 99-103. doi:10.1177/09 63721411402596

Schienle, A., Schäfer, A., Stark, R., Walter, B., Franz, M., & Vaitl, D. (2003). Disgust. sensitivity in psychiatric disorders: A questionnaire study. *The Journal of Nervous and Mental Disease, 191*, 12:831-834. doi.org/ 10.1097/01.nmd.0000100928.99910.2d

Schienle, A., Ille, R., Sommer, M., & Arendasy, M. (2014). Diagnosis of self-disgust in the context of depression. *Verhaltenstherapie, 24*,1:15-20.

doi.org /10.1159/000360189

Schienle, A. (2018). The Role of Moral Disgust and Disgust Regulation Deficits in Skin-Picking Disorder. *Psychiatria Danubina, 30*(Suppl 3), 136-140.

Schienle, A., Leutgeb, V., & Wabnegger, A. (2015). Symptom severity and disgust-related traits in borderline personality disorder: The role of amygdala subdivisions.
doi.org/10.1016/j.pscychresns.2015.04.002

Shen, Q., Mou, S., Wang, X., & Liu, Y. (2017). Reliability and Validity of Chinese Version of Social Impact Scale Applied in Study of Stigma in Colostomy Patients. *Journal of Chongqing Medical University,42*(09):1188-1192. (In Chinese)

Simmons, K. L., Smith, J. A., Bobb, K.-A., & Liles, L. L. M. (2007). Adjustment to Colostomy: Stoma Acceptance, Stoma Care Self-efficacy and Interpersonal Relationships. *Journal of Advanced Nursing, 60*(6), 627-635.
doi.org/10.1111/j.1365-2648.2007.04446.x

Simpson, J., Carter, S., Anthony, S. H., & Overton, P. G. (2006). Is Disgust a Homogeneous Emotion? *Motivation and Emotion, 30*(1), 31-41.
doi:10.1007/s1 1031-006-9005-1

Simpson, J., Hillman, R., Crawford, T., & Overton, P. G. (2010). Self‐esteem. and self‐disgust both mediate the relationship between dysfunctional cognitions and depressive symptoms. *Motivation and Emotion, 34*(4), 399–406.
doi.org/10.1007/s1 1031‐010‐9189‐2

Smith, D. M., Loewenstein, G., Rozin, P., Sherriff, R. L., & Ubel, P. A. (2007). Sensitivity to disgust, stigma, and adjustment to life with a colostomy. *Journal of Research in Personality, 41*(4), 787-803. doi.org/10.1016/j.jrp.2006.09.006

Spielberger, C.D., & Reheiser, E.C. (2003). *Measuring Anxiety, Anger, Depression, and Curiosity as Emotional States and Personality Traits with the STAI,*

ATAXI, and STPI (Eds.). Comprehensive Handbook of Psychological Assessment (pp. 70-85). Personality Assement. Hobken, NJ: John Wiley&Sons.

Steinhagen, E., Colwell, J., & Cannon, L. M. (2017). Intestinal Stomas-Postoperative Stoma Care and Peristomal Skin Complications. *Clinics in colon and rectal surgery, 30*(3), 184-192. doi.org/10.1055/s-0037-1598159

Szpilewska, K., Juzwiszyn, J., Bolanowska, Z., Milan, M., Chabowski, M., & Janczak D. (2018). Acceptance of Disease and the Quality of Life in Patients with Enteric Stoma. *Pol Przegl Chir ,90* (1): 13-17. doi.org/10.5604/01.3001.0011.5954

Terwee, C. B., Prinsen, C. A. C., Chiarotto, A., Westerman, M. J., Patrick, D. L., Alonso, J., Mokkink, L. B. (2018). COSMIN methodology for evaluating the content validity of patient-reported outcome measures: a Delphi study. *Quality of Life Research, 27*(5), 1159-1170. doi:10.1007/s11136-018-1829-0

Thorpe, G., Arthur, A., & McArthur, M. (2016). Adjusting to Bodily Change Following Stoma Formation: A Phenomenological Study. *Disability and Rehabilitation, 38*(18), 1791-1802. doi.org/10.3109/09638288.2015.1107768

Turner, M. C., O'Brien, J. D., Kahn, R. M, Mantyh, C.R., Migaly, J., & Ariely, D. (2008). Impact of Disgust on Intentions to Undergo Colorectal. Surgery. *Diseases of the Colon & Rectum, 61*(12), 1386-1392. doi: 10.1097/DCR.0000000000001254

Whelton, W. J., & Greenberg, L. S. (2005). Emotion in self-criticism. *Personality and Individual Differences, 38*(7), 1583-1595. doi.org/10.1016/j.paid.2004.09.024

Wu, H. K.-M., Chau, J. P.-C., & Twinn, S. (2007). Self-efficacy and Quality of Life Among Stoma Patients in Hong Kong. *Cancer Nurs, 30*(3). doi.org/10.1097/01.NCC.0000270704.34296.86

Yang, Y. L., Li, M. Y., Liu, L., & Wang, L. (2018). Perceived Stress and Its Associated Demographic-clinical Characteristics and Positive Expectations Among

Chinese Cervical, Kidney, and Bladder Cancer Patients. *Supportive Care in Cancer, 26*(7), 2303-2312. doi.org/10.1007/s00520-018-4081-9

Yuan, J. M., Zhang, J. E., Zheng, M. C., & Bu, X. Q. (2018). Stigma and Its. Influencing Factors Among Chinese Patients with Stoma. *Psycho-Oncology, 27*(6), 1565-1571. doi.org/10.1002/pon.4695

Ypsilanti, A., Lazuras, L., Powell, P., & Overton, P. (2019). Self-disgust as a potential. mechanism explaining the association between loneliness and depression. *Journal of Affective Disorders, 243*, 108-115. doi.org/10.1016/j.jad.2018.09.056

List of tables

Table 1 Demographic characteristics of the samples in study 1

Table 2 Goodness-of-fit indexes of model comparison and invariance models (N=1068)

Table 3 Correlation of the QASD with the SAS and TAS (N=1068)

Table 4 Demographic characteristics of the samples in study 2

Table 5 Descriptive statistics and reliability among all variables

Table 6 Correlations among all variables

Figure 4 Graphic representation of the mediation model (N = 476)

Table 7 The unstandardized regression coefficients(B) with standard errors (SE) and 95% confidence intervals (CI) (in parentheses) estimating personal disgust, behavioural disgust and stigma (M) and stoma care self-efficacy(Y)

Table 8 Demographic characteristics of the samples in study 3

Table 9 22-Item of CDS (N=222)

Table 10 Factor structures by confirmatory factor analysis (N=201)

Table 11 Model comparison for confirmatory factor analysis (N=201)

Table 12 Model fit of various invariance models (N=201)

Table 13 Factor score, correlation and Cronbach's α of the CDS (N=201)

Table 14 The 22-item CDS

List of figures

Figure 1 Flowchart depicting the process used for translation and validation of the instrument

Figure 2 Phases of development of the CDS

Figure 3 Factor structure of the refined model of the QASD

Figure 4 Graphic representation of the mediation model (N = 476)

Figure 5 Factor structure of the refined model of the CDS

List of abbreviations

AVE	Average Variance Extracted
B	The unstandardized Regression Coefficients
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CIs	Confidence Intervals
CMB	Common Methods Bias
CR	Composite Reliability
CVI	Content Validity Index
df	Degree of Freedom
EFA	Exploratory Factor Analysis
GFI	Goodness of Fit Index
KMO	Kaiser-Meyer-Olkin
NFI	Normed Fit Index
PAF	Principal Axis Factoring
RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
SE	Standard Errors
TLI	Tucker-Lewis Index
$\chi 2$	Chi-square test

List of publications

At the time of printing, the results reported herein have been published in the following journals:

1.Yanfei Jin, Yufeng Li, Gutiérrez-Colón Mar, Maria Jiménez-Herrera*

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2.Yanfei Jin, Hongmei Ma, Maria Jiménez-Herrera*

"Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy". Journal of Advanced Nursing. doi:10.1111/jan.14457

3.Yanfei Jin, Hongmei Ma, Yufeng Li, Yajing Zhang, Maria Jiménez-Herrera*

"Development and Psychometric Evaluation of the Colostomy Disgust Scale in Patienrs with Colostomy". European Journal of Cancer Care. doi:10.1111/ecc.13323

The following publication is based on work carried out during the master studies:

4.ChunnianCai, Chunmei Zhang, Yan Wang, Lina Xiong, **Yanfei Jin**, Changde Jin*

"Nursing students' satisfaction with bilingual teaching in nursing courses in China: A meta-analysis". Nurse Education Today, **2016**,44, 51-58. doi.org/10.1016/j.nedt.2016.05.014

5.Yanfei Jin, Lina Xiong, Gao Fei, Changde Jin*

"Validity and Reliability of Chinese Version of Questionnaire for the Assessment of Self-Disgust" (In Chinese). Journal of Nursing Science (China), **2016**, 31(03):80-83. doi:10.3870/j.issn1001-4152.2016.03.080

6.Yanfei Jin, Lina Xiong, Chunlian Cai, Changde Jin*

"The research progress of psychosis symptom assessment tool in patients with schizophrenia" (In Chinese). Journal of Nursing (China), **2015**, 22(16):17-21.

doi: 10.16460/j.issn1008-9969.2015.16.017

7.**Yanfei Jin**, Changde Jin*

"Overview of protection motivation theory and its application progress in different. populations" (In Chinese). Chinese Nursing Research, **2015**, 29(29):3585-3588.

doi: 10.3969/j.issn1009-6493.2015.29.001

8.**Yanfei Jin**, Changde Jin*

"Study on correlation between hope level and quality of life of patients with type 2 diabetes mellitus" (In Chinese). Chinese General Practice Nursing, **2015**,13(9) : 843-845.

doi: 10.3969/j.issn1674-4748.2015.09.039

9.Lina Xiong, **Yanfei Jin**, Changde Jin*

"The research progress of psychological intervention among family members of Alzheimer's disease patients" (In Chinese). Chinese Nursing Management, **2015**, 15(2):250-253.

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SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
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Addendum

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RESEARCH ARTICLE

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Questionnaire for the Assessment of Self-Disgust: The psychometric testing among mental disorders in China

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Abstract

Research on self-disgust is relevant to psychopathologic tendencies because it has been shown to play a critical role in several mental disorders. Examining self-disgust and exploring its role in mental health are significant goals. The purpose of this study was to translate the Questionnaire for the Assessment of Self-Disgust (QASD) into Chinese and evaluate its validity and reliability. The translation and validation of the QASD were guided by the World Health Organization's Process of Translation and Adaptation of Instruments. Three phases were undertaken: (a) professional translation and expert panel review, (b) pretesting, and (c) psychometric evaluation. The psychometric evaluation was tested among 1,068 patients who were recruited from two psychiatric hospitals and three psychological clinics of tertiary hospitals. In this study, multigroup confirmatory factor analysis (CFA) supported the two-factor structure of the original QASD construct. Measurement invariance showed that the QASD is invariant across the patients with heterogeneous mental health diagnoses. The correlation of QASD with the Self-Esteem Scale (SES) and the Trait Anger Scale (TAS) showed that it has good convergent validity and discriminative validity. Internal consistency and test–retest yielded acceptable results. Thus, the findings suggest that the Chinese version of the QASD is a reliable and valid instrument with adequate psychometric properties for assessment of self-disgust among patients with mental disorders in China.

KEYWORDS
disgust, mental disorders, reliability, self-disgust, validity

1 | INTRODUCTION

"Disgust has shown a great potential for being transferred to objects, as well as to other individuals and, in some instances, to the self" as stated in Davey (1994). That is to say, although the disgust response serves an important and adaptive function in the external stimulus, feelings of disgust may be generalized and directed towards the self when some aspects are seen as toxic, repugnant, or even dangerous, and this type of disgust response has been labelled self-disgust (Ille et al., 2014; Power & Dalgleish, 1997; Rozin, Haidt, & McCauley, 2000). Specifically, self-disgust is a persistent and maladaptive disgust response, reflecting a harsh, noxious and embodied feeling state (Roberts & Goldenberg, 2007). It is considered a stable and dysfunctional psychological phenomenon that encloses two interrelated domains of the self: physical self-disgust and behavioural self-disgust (Overton, Markland, Taggart, Bagshaw, & Simpson, 2008).

In the present, a number of studies have correlated self-disgust with varying numbers of pathologies. A qualitative study has suggested that self-disgust is a negative self-conscious emotion schema, associated with depression, problem around eating self-persecution, physical appearance, and interpersonal relationships (P.A. Powell, Overton, & Simpson, 2014a). Besides, self-disgust has been

shown to be involved in a number of mental health issues, including depression (Overton et al., 2008; P.A. Powell, Overton, & Simpson, 2014b; P.A. Powell, Azlan, Simpson, & Overton, 2016; Simpson, Hillman, Crawford, & Overton, 2010; Ypsilanti, Lazuras, Powell, & Overton, 2019), sexual dysfunction (de Jong & Borg, 2015), borderline personality disorder (BPD; Abdul-Hamid, Denman, & Dudas, 2014; Rüsch et al., 2010; A. Schienle et al., 2003), unhealthy behaviour (Palmeira, Pinto-Gouveia, & Cunha, 2017), and anxiety (Amir, Najmi, Bomyea, & Burns, 2010; B.O. Olatunji, Cox, & Kim, 2015; P.A. Powell et al., 2016). Furthermore, self-disgust has been shown to be a significant strong predictor of specific psychological problem, such as depressive symptoms (Overton et al., 2008; P.A. Powell, Simpson, & Overton, 2013), self-harm urges (Abdul-Hamid et al., 2014), and suicide risk (Brake, Rojas, Badour, Dutton, & Feldner, 2017). Finally, self-disgust has also been linked to psychological wellbeing in cancer groups (H.A. Azlan, Overton, Simpson, & Powell, 2017a; H.A. Azlan, Overton, Simpson, & Powell, 2017b).

Obviously, all aforementioned studies have focused on psychopathology and have shown that self-disgust plays a critical role in several mental disorders. Given previous theoretical associations have been made between self-disgust and other psychological phenomena, it suggests that the early detection and treatment of self-disgust may be important for prevention to clinical mental health problems (A. Schienle, Ille, Sommer, & Arendasy, 2014). Therefore, the precise measurement of self-disgust will be meaningful to better understanding these relationships. In 2008, Overton et al. provided the first evidence on the factor structure of self-disgust and developed a Self-Disgust Scale (SDS). Over the past decade, the SDS was the only available self-report measure of disgust towards the self (P.A. Powell, Overton, Simpson, 2014a). However, this scale does present some limitations. The first shortcoming is the method used to construct the factors; the authors used an orthogonal rotation method to obtain a more readily interpretable simple structure and assumed a hierarchical structure of self-disgust by calculating a composite score. The second shortcoming involves the size and composition of the sample; the authors combined a relatively small sample of mentally healthy individuals with a low set of indicator variables to measure different aspects of self-disgust. These limitations are known to affect the property of factor-analytic methods aiming to find stable factor structures with unbiased estimates of factor loadings. And as a result of the restraint of healthy respondents, concern exists about whether the results can be generalized to different psychopathologies.

Considering the aforementioned shortcomings of SDS, A. Schienle et al. (2014) constructed a new Questionnaire for the Assessment of Self-Disgust (QASD). In addition to using better samples and statistical methods than SDS, the QASD is more accurate in terms of item settings. For the SDS, Overton et al. (2008) had formulated items pertaining to the construction of "behaviour," "appearance," and "lack of self-esteem" and constructed four items for each of the constructs (k = 12). In contrast to SDS, the QASD contained twice as many items (k = 26).

Key Practitioner Message

- The Chinese version of the Questionnaire for the Assessment of Self-Disgust (QASD) is a reliable and valid instrument to assess the self-disgust among patients with mental disorders in China.
- The two-factor structure of QASD is highly tenable.
- The QASD is a promising tool for further investigation of the role of self-disgust in mental disorders.
- The QASD could be useful to better explore the psychological construct of self-disgust and the correlations with other psychological phenomena.

Furthermore, items on the QASD contain positive and negative wording, which is the same with SDS. Although the use of positive and negative item wording is often recommended in the literature (DeVellis, 1991; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), some studies have argued that the combination of positive and negative item wording can affect the structural validity of self-report measures. For this reason, A. Schienle et al. (2014) used multitrait-multimethod confirmatory factor analytic methods to measure the detrimental effect of item wording on the construct validity in the QASD (Eid, 2000; Höfling, Moosbrugger, Schermelleh-Engel, & Heidenreich, 2011). One limitation for the QASD needs to be clarified: same as the SDS, a few items of the QASD include vocabularies such as hate and shame; the concerns about the content validity of the QASD have been raised by P.A. Powell, Overton, Simpson (2014b). For example, the measured self-disgust may share at least as much commonality with other negative self-directed constructs, such as self-criticism and self-hatred. However, the developed QASD was a more precise scale in terms of factor construction and the composition of the sample selected to ensure that the scale was more comprehensive.

Because the QASD has been shown to be a reliable tool for measuring the self-disgust in mental disorders (Clarke, Simpson, & Varese, 2019; Ille et al., 2014; A. Schienle et al., 2014; A. Schienle, Leutgeb, & Wabnegger, 2015; A. Schienle, 2018), we believe that the QASD must be adapted for application to Chinese patients in future research. Thus, in order to advance the clinical research of self-disgust in China, especially the relationship between self-disgust and other psychopathology, we performed this study to translate the questionnaire for the assessment of self-disgust (QASD) into Chinese and evaluate its validity and reliability among Chinese mental disorders. The Chinese version of the QASD would be a promising tool for investigation of psychological construct of self-disgust, and it could be useful to provide methods and theoretical basis for subsequent clinical research on the relationship between self-disgust and other psychological disorders.

2 | METHODS

2.1 | Design

This study was designed as a cross-sectional survey to evaluate the psychometric properties of the QASD among mental disorders in Chinese. The translation and validation were guided by the World Health Organization's Process of Translation and Adaptation of Instruments (World Health Organization, 2014). As depicted in Figure 1, three distinct and sequential phases were undertaken: (a) professional translation and expert panel review, (b) pretesting, and (c) psychometric evaluation.

2.2 | Phase 1: Professional translation and expert panel review

Based on our review of current literatures, German and English versions of QASD are available at the present, but the validation of the QASD was only conducted in German but not in English, so we choose to translate German into Chinese in our study.

2.2.1 | Forward Translation

Permission to translate and validate the QASD was obtained from the author of the original scale. Two bilingual translators separately translated the original QASD into Chinese. Both of them had a medical background. One translator was aware of the purpose of the QASD translation, whereas the other was not. After the two translators finished the initial translation, discrepancies between the two Chinese versions were discussed, and the two versions were merged into a single version.

2.2.2 | Expert panels and backward translation

A panel of five experts, including three nursing experts and two psychology experts, examined the forward-translated and the original version of the QASD. Three important questions were addressed: (a) Is the translated word in Chinese the exact equivalent of the word in German? (b) If the Chinese word is not the exact equivalent, is there a better Chinese word to use? (c) Is it likely that the word will be easily understood by the Chinese who will complete the questionnaire? If a German word had multiple meanings for a research participant, the most appropriate Chinese word was used in its place.

For example, Item 14 of the QASD in the personal disgust subscale contains the question "I find it unpleasant to touch my problem areas." The Chinese translation of the German word "berühren" was the meaning of "contact with hands", which is not accurate in the sense of the original text. Therefore, the panel replaced a Chinese word that has a similar meaning to the word "mention." The purpose of this step is to review discrepancies in the meanings of the scale

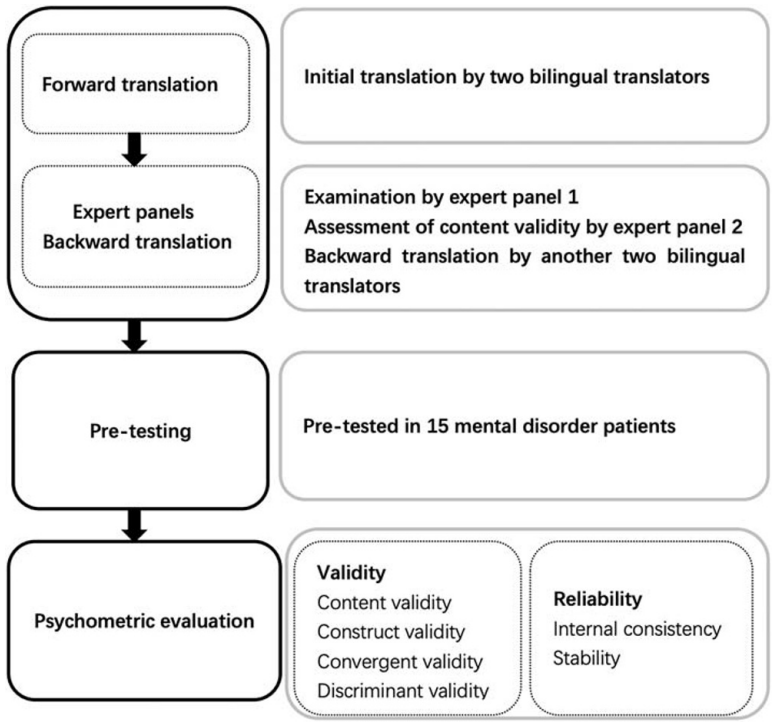

FIGURE 1 Flowchart depicting the process used for translation and validation of the instrument

items and evaluate the cultural and linguistic equivalence of each item until a consensus was achieved.

The second expert panel was then engaged to determine if the language, content, and structure of the Chinese-translated version of the QASD were appropriate for measuring the self-disgust in Chinese population. In this step,15 experts, including five psychiatrists, five associate professors, and five nursing specialists, were invited to score and evaluate the validity of each item using a 4-point rating scale (1 = *uncorrelated*, 2 = *weakly correlated*, 3 = *moderately correlated*, and 4 = *highly correlated*; D.F. Polit, Beck, & Owen, 2007). The content validity index (CVI) was used to examine the content validity scores for each item (I-CVI) and the scale-level CVI/average (S-CVI/Ave). The I-CVI is the proportion of experts who rate an item as relevant, whereas the S-CVI/Ave is the proportion of items rated as relevant by all raters (D.F. Polit & Beck, 2006). For a scale to be judged as having excellent content validity, it should contain only items with an I-CVI of ≥.78 and have a S-CVI/Ave of ≥.90 (D.F. Polit et al., 2007). The outcomes of the CVI processes are presented in the result section.

Following the recommendation of World Health Organization, the modified Chinese version of the QASD was given to another two bilingual translators separately for translation back into German. The back-translated version was remarkably similar to the original QASD. Then, the prefinal version was developed.

2.3 | Phase 2: Pretesting

The prefinal version was tested in 15 patients with mental disorder. The inclusion criteria were as follows: the subjects had been diagnosed mental disorder; had no cognitive impairment, able to communicate, and willing to participate. Participants were asked to comment on their understanding of the wording, and modifications were made according to the participants' feedback on the items. Finally, the final Chinese version of the QASD was generated (The translated Chinese version and English version of the 14-item QASD are provided in Supporting Information).

2.4 | Phase 3: Psychometric evaluation

2.4.1 | Setting and participants

The participants were recruited from a psychiatric hospital in Tianjin, north China. The inclusion criteria were as follows: (a) age over 18 years; (b) ability to communicate; and (c) willingness to participate. The exclusion criteria were as follows: suffering from serious acute or chronic diseases, such as severe heart failure, liver disease, kidney failure, malignant tumour, and so forth. After obtaining approval from the Tianjin University of Traditional Chinese Medicine Ethics Committee, the participants were enrolled in this study. Prior to the study, the participants were informed of the objectives, significance, and principles of privacy protection. Each of the participants signed the informed consent form and had the right to drop out at any time during the study. The research team consists of a doctoral student as the leader and five master students as research assistants, all of whom have been systematically trained. During the study period, five research assistants distributed questionnaires to patients and checked whether there were missing items when the questionnaires were collected. Once the missing items were found, the corresponding patients were immediately asked to fill in.

During the study period (2016–2020), a total of 1,100 questionnaires were sent out, and 1,068 remained after the invalid questionnaires were removed, with no missing values. The 1,068 participants were outpatients and inpatients at a psychiatric hospital. According to the diagnostic criteria (Chinese Classification of Mental Disorders, Third Edition [CCMD-3]) of the clinical psychiatrist on the patients' medical record, the participants have the following diagnoses: moderate to major depression (n = 210), eating disorders (n = 221), schizophrenia (n = 202), BPD (n = 204), and anxiety (n = 231). A total of 630 (58.99%) were male and 438 (41.01%) were female. The ages ranged from 18 to 57 years, with a mean age of 36.58 ± 14.14 years. Table 1 provides the participants' descriptive characteristics. Subsequently, 29 patients received a second survey approximately 2 weeks after responding, to assess test–retest reliability of the QASD.

2.5 | Measures

2.5.1 | Demographics and clinical information

Demographic and clinical information was obtained from the participants using a questionnaire designed by the researcher that yielded information about age, gender, education, marital status, place of residence, financial status, and mental disorder diagnosis.

2.5.2 | The Questionnaire for the Assessment of Self-Disgust

The QASD is a 14-item, self-reported measure for self-disgust that can be used in clinical and nonclinical samples (A. Schienle et al., 2014). It contains two subscales: “personal disgust”, with nine items to assess the devaluation of one's own physical appearance and personality (e.g., “I find myself repulsive”), and “behavioural disgust”, with five items that assess the devaluation of one's own behaviour (e.g., “I regret my behavior”). All items are rated on a 5-point Likert scale (*not true at all* to *absolutely true*). The total score reflects the standard of self-disgust, with high values indicating more self-disgust (Data S1). In the original version of the study, the QASD showed good psychometric properties, and the subsequent studies also reported the strong internal consistency of the QASD (α = 0.85, A. Schienle et al., 2015; α = 0.92, A. Schienle, 2018).

TABLE 1 Demographic characteristics of the samples

Variables	*N* = 1,068	%
Age (mean ± SD)	36.58 ± 14.14	
Gender (*n*/%)		
Male	630	58.99
Female	438	41.01
Education (*n*/%)		
Primary and below	80	7.49
Junior high school	355	33.24
Senior high school	456	42.7
College and above	177	16.57
Marital status (*n*/%)		
Single	29	2.72
Married	951	89.04
Divorced	33	3.09
Widowed	55	5.15
Place of residence (*n*/%)		
City	958	89.7
Rural	110	10.3
Financial status (*n*/%)		
Poor	342	32.02
Fair	205	19.19
Good	376	35.21
Very good	145	13.58
Mental disorder diagnosis (*n*/%)		
Depression	210	19.66
Eating disorders	221	20.69
Schizophrenia	202	18.91
BPD	204	19.1
Anxiety	231	21.63

Abbreviation: BPD, borderline personality disorder.

2.5.3 | Self-Esteem Scale

The Self-Esteem Scale (SES) is a unidimensional measure of global feeling of self-worth (Rosenberg, Rosenberg, & McCord, 1978). The scale contains 10 items, and all items are rated on a 4-point Likert scale (*strongly agree* to *strongly disagree*). The total score for self-esteem of individual is calculated by adding the responses of the 10 items. The internal consistency of Chinese version of SES was α = 0.85 (Lin & Huang, 2010).

2.5.4 | Trait Anger Scale

The Trait Anger Scale (TAS) is a 10-item scale that participants reported how angry they generally felt (Spielberger & Reheiser, 2003). All items are rated on a 4-point Likert scale (*almost never* to *almost always*). The total score for anger of an individual is calculated by adding the responses of the 10 items. The internal consistency of Chinese version of TAS was α = 0.76 (Liu & Gao, 2012).

2.6 | Statistical Analysis

IBM SPSS software Version 22.0 and Analysis of Moment Structure (AMOS) Version 17.0 were employed for data management and statistical analysis.

First, descriptive statistics were used to describe the demographic characteristics of participants. Then, after checking and confirming the validity of the raw data, the research team then conducted a confirmatory factor analysis (CFA). CFA was used as a critical step in refining the instrument and identifying the factorial structure of self-disgust in the QASD.

We assessed the goodness of fit for model using various parameters, including chi-square, the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root mean square of approximation (RMSEA). For TLI and CFI, values greater than 0.95 are considered to reflect an excellent fit, while values between 0.95 and 0.90 are considered indicative of an acceptable fit. For RMSEA, values less than 0.06 are considered indicative of a good fit, while those between 0.06 and 0.08 are considered indicative of an acceptable model (Harrington, 2009).

In the CFA, we confirmed the two-factor structure of self-disgust, through evaluating the factor loading of each of the items ≥0.50 (Gorsuch, 1997). Using the bifactor model as a method to describe an instrument's latent structure has recently become more prevalent (Gibbons, Rush, & Immekus, 2009). This approach could provide an alternative factor structure and support the use of a general factor while accounting for specific factor. Therefore, we examined the factor structure by conducting a one-factor model and bifactor model to compare with the proposed model (i.e., a two-factor model), which could provide useful insights on the underlying factor structure of self-disgust. In addition, we examined the measurement invariance across patients with heterogeneous mental health diagnoses by using multiple-group confirmatory factor analysis.

Furthermore, convergent validity was measured by Pearson's correlation between the QASD and SES; discriminant validity was measured by Pearson's correlation between the QASD and TAS. Last, to evaluate internal consistency of the QASD, both Cronbach's alpha and omega coefficients with a 95% confidence interval (CI) were measured. The omega coefficients were measured using the Userfriendlyscience package in R. Cronbach's alpha has previously been insufficient to measure the reliability of psychological scales for a variety of reasons (for details, see Dunn, Baguley, & Brunsden, 2014). Therefore, we measured the omega coefficients so that the reliability can be estimated in an alternative manner. Internal consistency was considered adequate when $\alpha \geq 0.70$ (S) and omega coefficient ≥ 0.70 (Cicchetti, 1994). Stability of the QASD was calculated by the test–retest (Munro, Visintainer, & Page, 1986).

3 | RESULT

3.1 | Validity

3.1.1 | Content validity

In our study, the item-level CVIs (I-CVIs) ranged from 0.87 to 1.00, and the calculated scale-level CVI (S-CVI) was 0.99, indicating that the QASD content was valid.

3.1.2 | Construct validity

Figure 2 shows the results of factor structure and model fit of the QASD using CFA. Final fit statistics were all optimal as follows: chi-square (χ^2 = 92.427, *df* = 76, *p* < .001), TLI = 0.995, CFI = 0.995, RMSEA = 0.010 (0.001, 0.021). Table 2 presents the fit indexes for model comparison. In accordance with our hypothesis, the results showed that the chi-square difference test between one-factor model and two-factor model was significant (703.360, Δdf = 1, *p* < .001), and the chi-square difference test between the bifactor model and two-factor model was significant (25.344, Δdf = 13, *p* < .05), which indicated that the two-factor model had a significantly better fit than the one-factor model and the bifactor model.

Further, we evaluated, whether the two-factor model generalizes across patients with heterogeneous mental health diagnoses (moderate to major depression: *N* = 210; eating disorders: *N* = 221; schizophrenia: *N* = 202; BPD: *N* = 204 and anxiety: *N* = 231) by a multiple-group analysis. First, the configural invariance (i.e., the unconstrained multigroup) model was computed. Under this process, both factor loadings and intercepts were unconstrained, thus allowing to differ between groups. The resulting model had an acceptable fit

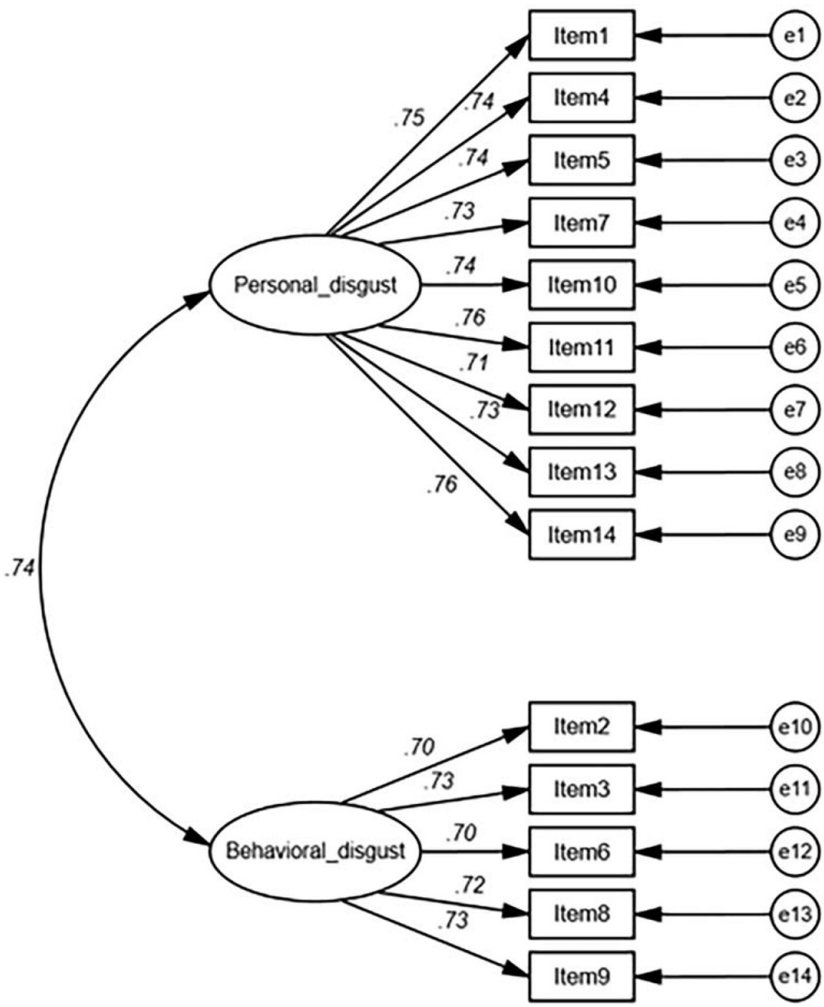

FIGURE 2 Factor structure of the refined model of the Questionnaire for the Assessment of Self-Disgust (QASD)

TABLE 2 Goodness-of-fit indexes of model comparison and invariance models (N = 1,068)

Model	χ^2	*df*	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf	*p*
Model comparison								
Two-factor model	92.427	76	0.995	0.995	0.010			
One-factor model	795.791	77	0.911	0.896	0.097	703.360	1	***
Bifactor model	67.803	63	0.922	0.906	0.088	25.344	13	.021
Measurement invariance								
Configural invariance	387.056	215	0.970	0.973	0.053			
Metric invariance	431.719	167	0.968	0.969	0.056	44.663	48	.610
Scalar invariance	489.269	119	0.964	0.969	0.056	57.550	48	.163

Abbreviations: CFI, comparative fit index; TLI, Tucker–Lewis index; RMSEA, root mean square of approximation.
*p < .05.
**p < .01.
***p < .001.

(χ^2 = 387.056, df = 215, CFI = 0.970, TLI = 0.973, RMSEA = 0.053). Metric invariance (factor loadings fixed, intercepts free) resulted in same fit indices as the configural invariance model ($\Delta\chi^2$ = 44.663, Δdf = 48, p = .610 > .05). Scalar invariance (factor loadings fixed, intercepts fixed) resulted in same fit indices as the metric invariance model ($\Delta\chi^2$= 57.550, Δdf = 48, p = .163 > .05). In the current findings, all measurement invariance models exhibited a good fit to the data and the final invariance model is a scalar invariance model cross the patients with heterogeneous mental health diagnoses, indicating satisfactory psychometric properties for measurement invariance. (Table 2).

3.1.3 | Convergent validity

Convergent validity was assessed by the correlation of the QASD with the SES. The personal disgust and behavioural disgust showed a negative moderate correlation with the SES (r = −.60, p < .01; r = −.55, p < .01), indicating adequate concurrent validity of the QASD (Table 3).

3.1.4 | Discriminant validity

Discriminant validity was assessed by the correlation of the QASD with the TAS. The personal disgust and behavioural disgust showed a low positive correlation with the TAS (r = .28, p < .01; r = .23, p < .01), indicating adequate divergent validity of the QASD (Table 3).

TABLE 3 Correlation of the QASD with the SAS and TAS (N = 1,068).

Dimensionality	SAS	TAS
Personal disgust	−.60	.28
Behavioural disgust	−.55	.23

Abbreviations: QASD, Questionnaire for the Assessment of Self-disgust; SAS, Self-Esteem Scale; TAS, Trait Anger Scale.

3.2 | Reliability

3.2.1 | Internal consistency reliability

The Cronbach's alpha of the personal disgust and behavioural disgust was 0.92 and 0.84, the omega coefficient was 0.92 [0.91, 0.92] and 0.84 [0.83, 0.86], indicating that the QASD had good internal homogeneity.

3.2.2 | Stability

To evaluate the test–retest reliability, 29 patients from the current sample completed the QSAD twice, with a time interval of 2 weeks. The intraclass correlation coefficient (ICC) for the personal disgust and behavioural disgust was 0.62 and 0.77, indicating that the QSAD has moderate stability over time.

4 | DISCUSSION

Given the self-disgust is increasingly used in clinical mental health, an adequate tool to effectively measure it is of great significance. Firstly, bridging the gap of previous researches, the present study is the first one to test the reliability and validity of the Chinese version of the QASD among Chinese mental disorders. Secondly, the study findings provide future researchers and clinicians with information of necessary steps to evaluate psychometric properties of QASD.

The translation of this study instrument dealt with two languages from different linguistic groups. The target language was Chinese, which is a Sino-Tibetan language,

whereas the source language was German, an Indo-European language. Due to the huge differences in cultural background, these languages differ from each other syntactically, semantically, and morphologically (G. Zhou, Chen, Feng, & Zhou, 2019; H. Zhou, Chen, Yang, & Dunlap, 2010). In cross-language translation, these factors, including cultural situation, emotiveness (the intention of the original

author is hidden in the text), untranslatability (no same meaning as the original word is available in the translated language), and the translators, should be considered (Degani et al., 2016). The effect of the aforementioned factors was minimized by following a standard method of translation in the translation process. In our study, we strictly followed the guidance of the World Health Organization's Process of Translation and Adaptation of Instruments. Through the translation–retranslation procedure and the evaluation of expert panels, we translated them into Chinese functional equivalence to the original items.

Assessment of the translated instrument's reliability and validity revealed acceptable outcomes that confirmed the QASD has good psychometric properties. As shown in results, the Chinese QASD Cronbach's alpha was consistent with the result in the Austria study (0.92) (A. Schienle, 2018). However, the Cronbach's alpha of the subscale "personal disgust" (0.92) and "behavioural disgust" (0.84) found in this research was slightly different from the study by Ille et al. (2014) (0.79, 0.91). We speculate that among other reasons, the subtle variations of internal consistency in our and previous studies could be due to differences in sample size and the clinical characteristics of the study subjects. Given the consensus in the psychometric literature that Cronbach's alpha is rarely appropriate and given the good performance of omega when the assumptions of alpha are not met, it is recommended that omega be calculated along with CIs for each subscale comprising the test (Dunn et al., 2014). Because there was no difference in the results of the alpha and omega of the subscale, this suggested that the evidence of good internal consistency in QSAD is sufficient. Besides, the results showed moderate test–retest reliability; hence, our findings indicated that the QASD is stable for 2 weeks.

With regard to the construct of self-disgust, a model of problematic and enduring self-disgust as a distinct emotion schema was raised by P.A. Powell, Simpson, and Overton (2015). They described self-disgust as a lasting disgust-based cognitive–affective orientation towards self, composed of interacting state and higher order trait components. The construct of self-disgust has also been treated both as a negative personality trait (B.O. Olatunji, David, & Ciesielski, 2012) and as a distinct self-conscious emotion (Roberts & Goldenberg, 2007). Yet, despite these previous theoretical results, the self-disgust construct itself remains particularly ambiguous (P.A. Powell, Overton, Simpson, 2014a). Even so, the two-factor structure of self-disgust is persuasive in QSAD and SDS. As had been predicted, our study revealed that the Chinese version of the QASD comprises two dimensions of self-disgust: personal disgust and behavioural disgust. These perfectly fits the two-factor model proposed by the original authors. Generally, the two factors of the QSAD was consistent with those of the SDS: the "disgusting self," concerned with enduring context-independent aspects of the self, and "disgusting ways," concerned with behaviour (Overton et al., 2008). Moreover, similar factors have been obtained from studies of self-criticism: "hated self" and "inadequate self" (Gilbert, Clarke, Hempel, Miles, & Irons, 2004). This finding reveals that the experience of self-disgust may at times include some kind of self-criticism, which was consistent with the results of Simpson et al. (2010). The evidence of recent correlations suggest that self-disgust may share some commonality with self-directed negative cognitions (Overton et al., 2008; Simpson et al., 2010); it is likely that the self-disgust is somewhat an indicator of other negative self-directed constructs (e.g., self-criticism and self-hatred). P.A. Powell, Overton, Simpson (2014a) pointed that a minority of items in the SDS include vocabularies such as hate and dislike, which are likely to tap into additional constructs. However, these vocabularies about negative self-conscious emotion also appeared on the QASD scale, which is something we should be wary of.

To further identify the factorial structure of the QASD, we examined the factor structure by conducting a one-factor model and bifactor model to compare with the two-factor model. The results showed that the two-factor structure model of the QASD is convincing and worthy of promotion. Previous research has shown that different psychiatric disorders investigated differed from each other regarding the severity of dysfunctional self-perception and the associated psychopathologic symptoms. For example, patients afflicted with BPD and patients with eating disorders reported the most elevated personal disgust; personal disgust was predictive of psychoticism and depression, while behavioural disgust was predictive of anxiety (H.A. Azlan, Overton, Simpson, Powell, 2017a; Ille et al., 2014; P.A. Powell et al., 2013). Therefore, in order to determine whether the two-factor structure of QASD is stable in different psychiatric samples, we evaluated the extent to which the two-factor structure can be replicated across patients with heterogeneous mental health diagnoses. The findings indicated that the QASD has the same structure and meaning across patients with heterogeneous mental health diagnoses. These results provided important additional information on the potential utility of QASD for different groups of mental disorders.

The negative moderate correlation between the self-disgust and the self-esteem was consistent with the study of Simpson et al. (2010) (r = −.67), which implied that the structure of self-disgust and self-esteem are supposed to be similar to some extent. That is to say, as two extremes of cognition and emotion in the structure of self, self-disgust and self-esteem construct a continuum from negative to positive (Johnson & Wood, 2017). The low correlation between the self-disgust and trait anger showed that both of them belong to negative emotions, but they are not much related. This result suggested that although self-disgust has both cognitive components sand emotional components, it is more specifically a self-concept of how one feels disgusted towards themselves.

In addition, the two factors personal disgust and behavioural disgust were moderately correlated with each other (r = .68), which was higher than the result of the original scale (r = .48; A. Schienle et al., 2014). This implied that the two trait facets of self-disgust are partially independent from each other and therefore may be differentially related to other trait factors as well as to specific psychopathologies. For example, hostility and psychoticism were the best predictors for personal disgust, while interpersonal sensitivity and anxiety predicted behavioural disgust (Ille et al., 2014). Therefore, further research should continue to focus on these interesting associations concerning different aspects of self-disgust and their potential relationship with other trait factors in mental disorders.

4.1 | Limitations

Although our findings provide important support for the psychometric properties of the QASD Chinese version, some methodological limitations may reduce the scope of their generalizability. First, according to the newly criteria for good content validity of a patient-reported outcome measure. Content validity is formed of item relevance, appropriateness of response options and recall period, comprehensiveness, and comprehensibility (Terwee et al., 2018). In our study, we just test the comprehensibility and item relevance, which only reflect some degree of content validity. For that, we suggest that a fuller investigation of content validity is warranted. Second, we gathered the sample exclusively in the urban area of Tianjin, and thus, the results might not be generalizable to other locations in China; a larger and more diverse sample is needed in future research. Besides, due to limitations in time and finance, we could not provide face-to-face instructions during the process of completing the questionnaire, which might have resulted in a higher response rate. Therefore, an alternative method of collecting the data may be needed in the future.

5 | CONCLUSION

In this study, our findings suggest that the QASD Chinese version is a reliable and valid instrument with adequate psychometric properties to assess self-disgust.

Furthermore, our study has the value of offering evidence that the QASD is a promising tool for further investigation of the role of self-disgust in mental health problems. Specifically, the two facets, personal and behavioural disgust, can be investigated together with other facets of mental health problems in clinical groups to explore potential relationships.

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AUTHOR CONTRIBUTIONS

Y. J. and M. J. were involved in the study's conception and design; Y. J. and Y. L. were involved in data collection and analysis; and Y. J., Y. L., M. J., and M. G. drafted the manuscript.

ETHICS DECLARATIONS

The study was approved by the Tianjin University of Traditional Chinese Medicine Ethics Committee (reference number: 2016-1217).

The participants signed the informed consent form and had the right to drop out at any time during the study.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

There is no conflict interest.

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REFERENCES

Abdul-Hamid, S., Denman, C., & Dudas, R. B. (2014). Self-relevant disgust and self-harm urges in patients with borderline personality disorder and depression: A pilot study with a newly designed psychological challenge. *PLoS ONE*, *9*(6), e99696. https://doi.org/10.1371/journal.pone.0099696

Amir, N., Najmi, S., Bomyea, J., & Burns, M. (2010). Disgust and anger in social anxiety. *International Journal of Cognitive Therapy*, *3*(1), 3–10. https://doi.org/10.1521/ijct.2010.3.1.3

Azlan, H. A., Overton, P. G., Simpson, J., & Powell, P. A. (2017a). Differential disgust responding in people with cancer and implications for psychological wellbeing. *Psychology & Health*, *32*(1), 19–37. https://doi.org/10.1080/08870446.2016.1235165

Azlan, H. A., Overton, P. G., Simpson, J., & Powell, P. A. (2017b). Effect of partners' disgust responses on psychological wellbeing in cancer patients. *Journal of Clinical Psychology in Medical Settings*, *24*, 355–364. https://doi.org/10.1007/s10880-017-9521-z

Brake, C. A., Rojas, S. M., Badour, C. L., Dutton, C. E., & Feldner, M. T. (2017). Self-disgust as a potential mechanism underlying the association between PTSD and suicide risk. *Journal of Anxiety Disorders*, *47*, 1–9. https://doi.org/10.1016/j.janxdis.2017.01.003

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, *6*, 284–290. https://doi.org/10.1037/1040-3590.6.4.284

Clarke, A., Simpson, J., & Varese, F. (2019). A systematic review of the clinical utility of the concept of self-disgust. *Clinical Psychology & Psychotherapy*, *26*(1), 110–134. https://doi.org/10.1002/cpp.2335

Davey, G. C. (1994). Self-reported fears to common indigenous animals in an adult UK population: The role of disgust sensitivity. *British Journal of Psychology*, *85*(4), 541–554.

de Jong, P. J., & Borg, C. (2015). Contemporary models of sexual behaviour propose that sexual responses involve sexual inhibitory. In P. A. Powell, P. G. Overton, & J. Simpson (Eds.), *The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust* (pp. 89–112). London: Karnac.

Degani, T., Prior, A., Eddington, C. M., da Luz, A., Fontes, A. B., & Tokowicz, N. (2016). Determinants of translation ambiguity: A within and cross-language comparison. *Linguistic Approaches to Bilingualism*, *6*(3), 290–307. https://doi.org/10.1075/lab.14013.deg

DeVellis, R. F. (1991). *Scale development: Theory and applications*. Newbury Park, CA: Sage.

Dunn, T. J., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology*, *105*(3), 399–412. https://doi.org/10.1111/bjop.12046

Eid, M. (2000). A multitrait-multimethod model with minimal assumptions. *Psychometrika*, *65*, 241–261. doi.org/10.1007/BF02294377

Gibbons, R. D., Rush, A. J., & Immekus, J. C. (2009). On the psychometric validity of the domains of the PDSQ: An illustration of the bi-factor item response theory model. *Journal of Psychiatric Research*, *43*(4), 401–410. https://doi.org/10.1016/j.jpsychires.2008.04.013

Gilbert, P, Clarke, M, Hempel, S, Miles, J. N V., & Irons, C (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students.. *British Journal of Clinical Psychology*, *43*(1), 31–50. https://doi.org/10.1348/014466504772812959

Gorsuch, R. L. (1997). Exploratory factor analysis: Its role in item analysis. *Journal of Personality Assessment*, *68*(3), 532–560. https://doi.org/10.1207/s15327752jpa6803_5

Harrington, D. (2009). *Confirmatory factor analysis* (2nd ed.). New York: Oxford. University Press.

Höfling, V, Moosbrugger, H, Schermelleh-Engel, K, & Heidenreich, T (2011). Mindfulness or Mindlessness?. *European Journal of Psychological Assessment*, *27*(1), 59–64. https://doi.org/10.1027/1015-5759/a000045

Ille, R., Schögglb, H., Kapfhammer, H., Arendasy, M., Sommer, M., & Schienle, A. (2014). Self-disgust in mental disorders—Symptom-related or disorder-specific? *Comprehensive Psychiatry*, *55*, 938–943. doi.org/10.1016/j.comppsych.2013.12.020

Johnson, J., & Wood, A. M. (2017). Integrating positive and clinical psychology: Viewing human functioning as continua from positive to negative can benefit clinical assessment, interventions and understandings of resilience. *Cognitive Therapy and Research*, *41*(3), 335–406. doi.org/10.1007/s10608-015-9728-y

Lin, X. Q., & Huang, Z. J. (2010). Rosenberg 自尊量表中文版条目8处理方法的再讨论.[Re-discussion of the Chinese version of the Rosenberg Self Esteem Scale Item 8]. *中国校医*, *24*(4), 263–265.

Liu, H. J., & Gao, H. M. (2012). 状态-特质愤怒表达量表修订版在大学生中的信效度. [Reliability and validity of the Chinese version of. State-Trait Anger Expression Inventory-2 in college students]. *中国心理卫生杂志*, *26*(1), 70–76.

Munro, B.H, Visintainer, M.A, & Page, E.B (1986). Statistical Methods for Health Care Research. JB Lippincott: Philadelphia.

Olatunji, B. O., Cox, R., & Kim, E. H. (2015). Self-disgust mediates the associations between shame and symptoms of bulimia and obsessive-compulsive disorder. *Journal of Social and Clinical Psychology*, *34*(3), 239–258. https://doi.org/10.1521/jscp.2015.34.3.239

Olatunji, B. O., David, B., & Ciesielski, B. G. (2012). Who am I to judge? Self-disgust predicts less punishment of severe transgressions. *Emotion*, *12*, 169–173. https://doi.org/10.1037/a0024074

Overton, P. G., Markland, F. E., Taggart, H. S., Bagshaw, G. L., & Simpson, J. (2008). Self-disgust mediates the relationship between dysfunctional cognitions and depressive symptomatology. *Emotion*, *8*, 379–385. https://doi.org/10.1037/1528-3542.8.3.379

Palmeira, L., Pinto-Gouveia, J., & Cunha, M. (2017). The role of self-disgust in eating psychopathology in overweight and obesity: Can self-compassion be useful? *Journal of Health Psychology*, *10*, 780–790. https://doi.org/10.1177/1359105317702212

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, *29*(5), 489–497. https://doi.org/10.1002/nur.20147

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, *30*(4), 459467. https://doi.org/10.1002/nur.20199

Powell, P. A., Azlan, H. A., Simpson, J., & Overton, P. G. (2016). The effect of disgust-related side-effects on symptoms of depression and anxiety in people treated for cancer: A moderated mediation model. *Journal of Behavioral Medicine*, *39*(4), 560–573. https://doi.org/10.1007/s10865-016-9731-0

Powell, P. A., Overton, P. G., & Simpson, J. (2014a). The revolting self: An interpretative phenomenological analysis of the experience of self-disgust in females with depressive symptoms. *Journal of Clinical Psychology*, *70*(6), 562–578. https://doi.org/10.1002/jclp.22049

Powell, P. A., Overton, P. G., & Simpson, J. (2014b). P.A. Powell P. G. Overton & J. Simpson (Eds.). *The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust*. London: Karnac.

Powell, P. A., Simpson, J., & Overton, P. G. (2013). When disgust leads to. dysphoria: A three-wave longitudinal study assessing the temporal relationship between self-disgust and depressive symptoms. *Cognition and Emotion*, *27*(5), 900–913. https://doi.org/10.1080/02699931.2013.767223

Powell, P. A., Simpson, J., & Overton, P. G. (2015). An introduction to the revolting self: Self-disgust as an emotion schema (Eds.). In *The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust* (pp. 1–24). London: Karnac.

Power, M. J., & Dalgleish, T. (1997). *Cognition and emotion: From order to disorder*. Hove, United Kingdom: Psychology Press. Tybur, J. M., Lieberman

Roberts, T. A., & Goldenberg, J. L. (2007). Wrestling with nature: An. existential perspective on the body and gender in self-conscious emotions. In J. L. Goldenberg (Ed.), *The self-conscious emotions: Theory and research* (pp. 389–406). New York: Guildford.

Rosenberg, F. R., Rosenberg, M., & McCord, J. (1978). Self-esteem and delinquency. *Journal of Youth and Adolescence*, *7*, 279–294. https://doi.org/10.1007/BF01537978

Rozin, P., Haidt, J., & McCauley, C. R. (2000). Disgust. M. Lewis & JM. Havilland-Jones (Eds.). In *Handbook of emotions* (2nd ed.) (pp. 637–653). New York: Guilford Press.

Rüsch, N., Schulz, D., Valerius, G., Steil, R., Bohus, M., & Schmahl, C. (2010). Disgust and implicit self-concept in women with borderline personality disorder and posttraumatic stress disorder. *European Archives of Psychiatry and Clinical Neuroscience*, 261, 369–376. https://doi.org/10.1007/s00406-010-0174-2

Schienle, A. (2018). The role of moral disgust and disgust regulation deficits in skin-picking disorder. *Psychiatria Danubina*, *30*(Suppl 3), 136–140. http://europepmc.org/abstract/MED/29781449.

Schienle, A., Ille, R., Sommer, M., & Arendasy, M. (2014). Diagnosis of self-disgust in the context of depression. *Verhaltenstherapie*, *24*(1), 15–20. doi.org/10.1159/000360189

Schienle, A., Leutgeb, V., & Wabnegger, A. (2015). Symptom severity and disgust-related traits in borderline personality disorder: The role of amygdala subdivisions. *Psychiatry Research: Neuroimaging*, *232*(3), 203–207. https://doi.org/10.1016/j.pscychresns.2015.04.002

Schienle, A., Schäfer, A., Stark, R., Walter, B., Franz, M., & Vaitl, D. (2003). Disgust sensitivity in psychiatric disorders: A questionnaire study. *The Journal of Nervous and Mental Disease*, *191*(12), 831–834. https://doi.org/10.1097/01.nmd.0000100928.99910.2d

Simpson, J., Hillman, R., Crawford, T., & Overton, P. G. (2010). Self-esteem. and self-disgust both mediate the relationship between dysfunctional cognitions and depressive symptoms. *Motivation and Emotion*, *34*(4), 399–406. https://doi.org/10.1007/s11031-010-9189-2

Spielberger, C. D., & Reheiser, E. C. (2003). Measuring anxiety, anger, depression, and curiosity as emotional states and personality traits with the STAI, ATAXI, and STPI (Eds.). In *Comprehensive handbook of psychological assessment*. Personality assessment. (pp. 70–85). Hobken, NJ: John Wiley & Sons.

Terwee, C. B., Prinsen, C. A. C., Chiarotto, A., Westerman, M. J., Patrick, D. L., Alonso, J., & Mokkink, L. B. (2018). COSMIN methodology for evaluating the content validity of patient-reported outcome measures: A Delphi study. *Quality of Life Research*, *27*(5), 1159–1170. https://doi.org/10.1007/s11136-018-1829-0

World Health Organization. (2014). Process of translation and adaptation of instruments. http://www.who.int/substance_abuse/research_tools/translation/en/.

Ypsilanti, A., Lazuras, L., Powell, P., & Overton, P. (2019). Self-disgust as a potential mechanism explaining the association between loneliness and depression. *Journal of Affective Disorders*, *243*, 108–115. https://doi.org/10.1016/j.jad.2018.09.056

Zhou, G., Chen, Y., Feng, Y., & Zhou, R. (2019). Processing of translation-ambiguous words by Chinese–English bilinguals in sentence context. *Journal of Psycholinguistic Research*, *48*(5), 1133–1161. https://doi.org/10.1007/s10936-019-09650-1

Zhou, H., Chen, B., Yang, M., & Dunlap, S. (2010). Language nonselective access to phonological representations: Evidence from Chinese–English bilinguals. *The Quarterly Journal of Experimental Psychology*, *63*(10), 2051–2066. https://doi.org/10.1080/17470211003718705

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
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Addendum Nº2(Original article)

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Self-disgust and stigma both mediate the relationship between stoma acceptance and stoma care self-efficacy

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Abstract

Aim: This paper is a report of a study exploring the relationship between stoma acceptance and stoma care self-efficacy in patients with colostomy and whether self-disgust and stigma play mediating roles in this relationship.

Design: A cross-sectional survey design.

Method: In all, 476 participants were recruited from a tertiary hospital and completed structured, anonymous, self-report measures of stoma acceptance, self-disgust, stigma, and stoma care self-efficacy between January 2016-March 2017.

Results: Stoma acceptance was significantly negatively associated with personal disgust ($r = -.640$, $p<.001$), behavioural disgust ($r = -.384$, $p<.001$), and stigma ($r = -.309$, $p<.001$) and significantly positively associated with stoma care self-efficacy ($r = .689$, $p<.001$). Furthermore, regression-based mediation modelling showed that personal disgust and stigma had significant mediating effects on stoma acceptance and stoma care self-efficacy.

Conclusion: We demonstrated, for the first time, that emotional responses (self-disgust and stigma) play important roles in the association between stoma acceptance and stoma care self-efficacy. Addressing concerns about emotional disorder should become part of the routine care for patients with stoma.

Impact: Patients with colostomy must cope with many challenges and undergo profound changes in daily life. Acceptance of the existence of the stoma and effective management of the stoma can aid patients in the return to a full and active life. Illness acceptance and psychological states have been widely reported to be correlates of the ability to successfully reconstitute a meaning of life, but these have not been specifically explored in patients with colostomy. This study examined the effect of stoma acceptance on stoma care self-efficacy with the mediation role of self-disgust and stigma. Evidence of the relationship between illness acceptance and self-efficacy could offer practitioners to consider emotional factors like self-disgust and stigma when aiming to improve stoma care and management.

KEYWORDS
acceptance, colostomy, mediation analysis, nursing, self-disgust, self-efficacy, stigma, stoma

1 | INTRODUCTION

Colorectal cancer (CRC) is the third most common cancer and the fourth leading cause of cancer-related deaths worldwide (Arnold et al., 2017). With significantly increasing incidence and mortality rates, CRC is one of the five most commonly diagnosed cancers in China and it is estimated that approximately 376,300 patients were diagnosed with CRC and that 191,000 patients died from CRC in 2015 (Chen et al., 2016). The Miles operation and a permanent colostomy remain the most effective treatments and life-saving options for CRC, but increase the number of patients with colostomies, resulting in approximately 100,000 colostomy patients with permanent stomas in the United Kingdom, 750,000 in the United States, and 1,000,000 in China (Grant, McCorkle, Hornbrook, Wendel, & Krouse, 2013). Although the operation is a life-saving procedure, it nonetheless destroys the integrity of the patient's body and threatens both physical and psychological functioning, for example, through impaired self-image, changes in normal bowel function, and serious psychological distress (Ang, Chen, Siah, He, & Klainin-Yobas, 2013; Krouse et al., 2009). How people overcome these challenges and successfully manage their stomas has been the focus of much research.

According to the studies reviewed, stoma care has been a core issue for postoperative stoma (de la Encarnacion, 2019; Steinhagen, Colwell, & Cannon, 2017). However, despite the best efforts of an increasing number of stoma therapists to improve the technique and quality of stoma care, the problems associated with stomas have not decreased, such as common stoma complications, low quality of life, and severe psychological distress (Koc et al., 2017; Krishnamurty, Blatnik, & Mutch, 2017). It is clear that the approach to patient care should be comprehensive, not only focusing on physical aspects but also addressing other areas (e.g., spirituality, life status, and psychological distress; Capilla-Díaz et al., 2019) and should account for factors such as the patient's acceptance of stoma and emotional responses (Azlan, Overton, Simpson, & Powell, 2017b). Therefore, it is important to develop early, personalized, holistic preoperative and postoperative care plans based on the aforementioned factors. On top of the current common stoma care (e.g., dietary advice and stoma care skills guidance; Burch, 2013; Burch, 2017), these emotion-based care plans and interventions may be a new direction for improving the stoma care.

2 | BACKGROUND

Nurses play a key role in caring for patients with a stoma both in preoperative and postoperative stages, including helping the patients receive diagnosis and prognosis; adapting to life with a stoma; teaching practical skills in stoma care; and solving problems related to the family and support network (Baxter & Salter, 2000). One of the most challenging but indispensable roles of nursing care is to improve the self-management of patients for stoma so that they can successfully rehabilitate and psychosocially adapt to a new life after ending hospital treatment and returning to family and social life. Research on chronic diseases have shown that self-efficacy is an important core concept in self-management and a strong predictor of competence in stoma care management (Krouse et al., 2016; Seo, 2019). Studies have indicated that high level of self-efficacy can improve adaptability, solve mental health problems, and promote changes in healthy behaviour (Knowles et al., 2017; Seo, 2019; Sheeran et al., 2016).

In the study of chronic diseases, illness acceptance is also an important factor that affects disease therapy and prognosis (Lundgren, Dahl, Melin, & Kies, 2006; Nicholls et al., 2012). Acceptance is a psychological adaptation process of actively accepting the disease, which directly affects the patients' psychological statuses and behaviour (Stuifbergen, Seraphine, & Roberts, 2000). People who are able to accept their diseases are more likely to strive to recover, which enhances their self-care and reduces negative emotions. Therefore, the illness acceptance is seen as one of the important determinants of adapting to the difficult situations associated with disease. Studies have shown that patients who accept their diseases perceive less discrimination and higher self-esteem and quality of life (Szpilewska et al., 2018). In general, patients with stomas undergo three stages after operation: acceptance, adaptation, and autonomy (Capilla-Díaz et al., 2019). Due to the challenges associated with a colostomy, patients have difficulty with stoma acceptance. They use disengagement and avoidance as ways to cope, resulting in a lack of self-management of stoma care (Vonk-Klaassen, de Vocht, den Ouden, Eddes, & Schuurmans, 2016). Studies have confirmed that the level of stoma acceptance directly affects postoperative health status and is positively correlated with adaptation and quality of life (Szpilewska et al., 2018; Vonk-Klaassen et al., 2016). However, it seems that no studies have explicitly examined the intrinsic relationship between stoma acceptance and stoma self-efficacy in patients with colostomy, even though patients' reluctance for stoma acceptance can lead to avoidance, rejection, and some negative emotions (e.g., shame, stigma, and depression).

One factor that may be important in understanding the relation between acceptance and self-efficacy is self-disgust. Self-disgust is a persistent and maladaptive disgust response that reflects two interrelated domains of the self: disgust directed towards one's own physical appearance and personality (physical self-disgust; e.g., 'I find myself repulsive') and disgust directed towards one's actions (behavioural self-disgust; e.g., 'I regret my behaviour') (Schienle, Ille, Sommer, & Arendasy, 2014). Studies have shown that elevated disgust negatively predicts mental health, especially in relation to cancer and disfigurement, which involve changes to the body (Powell, Azlan, Simpson, & Overton, 2016; Shanmugarajah, Gaind, Clarke, & Butler, 2012). Colostomy is a prototypical case where disgust would be expected to occur. Multiple disgust elicitors are associated with colostomy, including body products (e.g., faeces and blood), body envelope violations (e.g., rectal insertions and invasive surgery), and hygiene (e.g., unpleasant odour) (Reynolds, Bissett & Consedine, 2018). Studies have shown that the unregulated disgust reactions are particularly threatening to

patients with colostomy: being more prone to disgust can predict increased stigma experiences, inadequate levels of adjustment, a lack of help-seeking behaviour, and social avoidance (Reynolds, Bissett, & Consedine, 2015; Smith, Loewenstein, Rozin, Sherriff, & Ubel, 2007). Generally, individuals use the same psychological mechanisms (e.g., avoidance and rejection) to deal with internal and external threats, but this can be especially difficult when the stimulus that causes disgust is the self (Gilbert, 2005). Accordingly, individuals with self-disgust may have stronger avoidance and rejection behaviours, such as avoiding touching or looking at themselves, masking the disgusting aspects of themselves, and even trying to distract themselves from the disliked object (Espeset, Gulliksen, Nordbø, Skårderud, & Holte, 2012). We can speculate that these avoidance-based strategies may have an adverse effect, leading to a lack of competence in self-management, so it is particularly important to explore the role of self-disgust in patients with colostomy.

With more in-depth research on self-disgust, self-disgust has been associated with other negative cognitions, such as self-criticism, guilt, and shame (Gilbert, 2015; Powell, Simpson, & Overton, 2015). Stigma refers to the experience of being discreditable by an individual suffering from a disease, it causes individuals to avoid, reject, and isolate themselves, increasing the potential harm of the disease (Quinn & Chaudoir, 2009). It is generally believed that patients with physical characteristic defects or changes, as well as obvious disease symptoms or features, are more likely to feel stigma (Dovidio, Major, & Crocker, 2000). With a stoma, patients with colostomy may experience self-disgust as well as self-perceived discrimination from the public (Yuan, Zhang, Zheng, & Bu, 2018). Individuals with higher levels of disgust will experience correspondingly higher levels of perceived stigmatization – they assume that others would be disgusted by their colostomies (Smith et al., 2007). In turn, a high level of perceived stigmatization is associated with insufficient confidence in stoma management. Previous research has indicated that the influence of disgust on adjustment and life satisfaction in colostomy occurs primarily through feelings of stigmatization (Smith et al., 2007). Thus, pervasive self-disgust and stigma may be particularly important to the study of stoma self-efficacy.

Based on the negative effects of self-disgust and stigma on patients with colostomy and the assumption that a reluctance to accept a stoma elicits negative emotions and aversive self-conscious feelings, it is sensible to argue that individuals with lower stoma acceptance may also experience more stigma and self-disgust. Besides, self-disgust has two primary sources: physical aspects of the self, such as physical and appearance; and behavioural aspects of the self, including characterological aspects and the way people behave. While both types of self-disgust have been related to mental health, research have suggested that they may have different importance in different areas, such as psychoticism, depression, and anxiety (Azlan, Overton, Simpson, & Powell, 2017a; Ille et al., 2014; Powell, Simpson, & Overton, 2013). For those with colostomy, since the primary change to the self is physical rather than one's characters or behaviour, we may expect any observed effects to be stronger for physical than behavioural self-disgust and stigma. Furthermore, a reluctance to accept a stoma induces negative thoughts about the self that influences stoma care and eventually leads to low stoma self-efficacy (Simmons, Smith, Bobb, & Liles, 2007; Szpilewska et al., 2018). Thus, it is plausible that stoma acceptance precedes the experience of stigma and self-disgust and that stigma and self-disgust mediate the association between stoma acceptance and stoma care self-efficacy.

In summary, it seems plausible that patients who are more accepting of their colostomy and show fewer negative emotions would be more likely to take control of their care and become better at managing. If the importance of such complex association can be proven for patients with colostomy, it means that we can find other ways of delivering effective care to patients with colostomy. Specifically, this will help health professionals to develop a care plan that should consider the emotional factors and stoma acceptance. Besides, during elective surgeries, stoma therapists and clinical nurses could particularly assess patients' emotional responses, give adequate support or relevant interventions to them, even continue to track their emotional factors after surgery, which will help the patients cope with the process of having a stoma and better accept the presence of the stoma. Since the literature reported that males and females may respond differently to issues related to stoma (Gautam & Poudel, 2016; Grant et al., 2011) and considering the effects of stoma-related negative symptoms and duration of stoma implantation (Piwonka & Merino, 1999; Smith et al., 2007), we investigated whether personal and/or behavioural self-disgust and/or stigma would mediate the relationship between stoma acceptance and stoma care self-efficacy, when gender, stoma-related negative symptoms, and duration of stoma implantation were controlled. We also compared the degree of the mediating effects of the personal disgust, behavioural disgust, and stigma in the path between stoma acceptance and stoma care self-efficacy. We predicted the following:

1. Stoma acceptance would be positively related to stoma care self-efficacy and negatively related to self-disgust and stigma.
2. Personal and/or behavioural self-disgust and/or stigma would negatively mediate the effect of stoma acceptance and stoma care self-efficacy.
3. The path between stoma acceptance and stoma care self-efficacy would be mediated more by personal disgust than by behavioural disgust and stigma.

3 | THE STUDY

3.1 | Aim

This study aims to explore the associations between stoma acceptance and stoma care self-efficacy in patients with colostomy and whether self-disgust and stigma play mediating roles in this relationship.

3.2 | Design

The study employed a cross-sectional survey design, with the STROBE guidelines used for this study.

3.3 | Participants

A convenience sample of patients with colostomy who presented to the stoma clinic for check-ups in a tertiary hospital in Tianjin was chosen for the study. The eligibility criteria were patients who: (1) had a diagnosis of CRC and had been created a permanent stoma at least 1 month prior to the study; (2) were 18 years of age or older; (3) were able to speak and write Chinese; and (4) were willing to participate. The exclusion criteria included patients with a history of mental illness; other cancer metastases or other serious physical illnesses.

From January 2016-March 2017, 485 patients were approached and nine refused to take part. Therefore, 476 patients took part and provided assessable data. The age of the respondents ranged from 45 = *N* = 81. More than half (54.62%, *N* = 260) of the participants were female and 97.48% (*N* = 464) were married. 49.58% (*N* = 236) had stoma complications, 43.70% (*N* = 208) had retained their stomas for 3 months to 1 year, and most (76.87%, *N* = 359) had a sigmoid colostomy. The demographics of the samples are reported in Table 1.

TABLE 1 Demographic characteristics of the samples

Variable	*N* = 476	%
Age [Mean (*SD*)]	60.95(7.38)	
Gender		
Male	216	45.38
Female	260	54.62
Level of Education		
Primary or below	32	6.72
Junior high school	158	33.19
Senior high school	204	42.86
College and above	82	17.23
Marital status		
Single	12	2.52
Married	430	90.34
Divorced	11	2.31
Widowed	23	4.83
Place of residence		
City	436	91.60
Rural	11	8.40
Living status		
With others	457	96.01
Alone	19	3.99
Monthly income (yuan)		
<3,000	134	28.15
3001–5000	276	57.98
>5,000	66	13.87
Family history of colorectal cancer		
Yes	26	5.46
No	450	94.54
Complications of stoma		
Yes	236	49.58
No	240	50.42
Duration of stoma implantation		
<3 months	76	15.97
3 months to 1 year	208	43.70
>1 year	192	40.33
Stoma type		
Sigmoid colostomy	400	84.03
Descending colostomy	6	1.26
Ileum colostomy	70	14.71

3.4 | Data collection procedure

The research team consisted of a doctoral student and three master students, all of whom had been systematically trained. Once written consent was secured, questionnaires were distributed to the patients. After the patients completed the questionnaire, answers were immediately checked by the researchers to ensure the questionnaires were completed. If missing values were found, the questionnaire was returned to the patient so that he or she could fill in the missing items. A small gift was provided as a reward.

3.5 | Ethical considerations

The study was approved by the human research ethics committee of Tianjin People's Hospital (TPH No.2016–1067). Participants were provided with written and verbal information about the study, including the level of involvement required, the voluntary nature of participation, and the right to withdraw at any time.

3.6 | Measures

3.6.1 | Stoma acceptance

We used the 8-item Acceptance of Illness Scale (AIS) to measure stoma acceptance (Felton, 1984). The Cronbach's alpha for the original version was 0.820 and the Chinese version was 0.820 (Jiang, Lai, Livenh, Ye, & Cai, 2013). The ASI showed a good reliability in patients with colostomy (Nowicki, Marciniak, Farbicka, & Banaszkiewicz, 2015; Szpilewska et al., 2018). Because the AIS measures acceptance of illness in general and to ensure patients focus on their stoma rather than on other pathologies, the word 'illness' on

the scale items was substituted by the word 'stoma' in the study by Simmons et al. (2007). Based on the responses from their sample, the result showed that the internal consistency of the scale had improved (Cronbach's alpha = 0.900). Therefore, to accurately measure stoma acceptance, we, in the same vein, replaced the word 'illness' with the word 'stoma' in the scale items and the measure showed adequate internal consistency estimate in our study (Cronbach's alpha = 0.893).

3.6.2 | Self-disgust

We used the Questionnaire for the Assessment of Self-Disgust (QASD) to measure self-disgust (Schienle et al., 2014). It contains two subscales: 'personal disgust', which has nine items assess the devaluation of one's own physical appearance and personality and 'behavioural disgust', which has five items assess the devaluation of one's own behaviour. The Cronbach's alpha for the original version was 0.92 and the Chinese version was 0.90 (Jin, Xiong, Gao, & Jin, 2016). Due to the lack of tools specifically for self-disgust in patients with cancer, researchers used the self-disgust scale (SDS; Overton, Markland, Taggart, Bagshaw, & Simpson, 2008) to measure the self-disgust caused by cancer (Azlan et al., 2017a, 2017b). However, recent studies have shown that the newly developed QASD is more accurate than SDS in terms of factor construction, sample composition, and item settings (Ille et al., 2014; Jin, Li, Gutiénez-Colón & Jiménez-Herrera, 2020; Powell, Overton, & Simpson, 2014; Schienle et al., 2014). Therefore, we used the QASD and to ensure the patients refer the items to the situation of stoma, we specifically marked the instruction at the beginning of the questionnaire 'please focus on the feeling under the stoma rather than other diseases'. In this study, the Cronbach's alpha for the personal disgust and behavioural disgust were 0.944 and 0.850, respectively.

3.6.3 | Stigma

The stigma of the patients with colostomy was measured using the 24-item Social Impact Scale (SIS), which has previously been used to examine stigma among patients with cancer (Fife & Wright, 2000). The Cronbach's alpha for the original version was 0.840 and the Chinese version tested in patients with colostomy was 0.92 (Shen, Mou, Wang, & Liu, 2017). In this study, the Cronbach's alpha was 0.93.

3.6.4 | Stoma-related negative symptoms

After consulting two anorectal surgeons and combining relevant literature (Krishnamurty et al., 2017), we listed the common stoma-related negative symptoms (unpleasant odour, stoma bag leakage, skin irritation, bleeding, diarrhoea and constipation, retraction of stoma, fatigue, pain, partial necrosis, prolapse, parastomal hernia, stenosis, and negative emotions related to stoma) and an item named 'others with a hyphen' (if the patient has more other symptoms which are not listed). The patients were asked to tick the stoma-related negative symptoms that they had experienced in the past weeks. The researchers calculated the number of negative symptoms for each patient based on the total number of ticks each patient gave.

3.6.5 | Stoma care self-efficacy

We used the Stoma Self-efficacy Scale to measure the self-efficacy of patients with stoma (Bekkers, Van Knippenberg, Van Den Borne, & Van Berge-Henegouwen, 1996). It contains two subscales: the Stoma Care Self-efficacy, which measures a person's perceived self-efficacy for stoma care and the Social Self-efficacy, which measures a person's perceived self-efficacy for social functioning in relation to the stoma. The correlation between the two subscales is 0.73, which may lead to unstable regression coefficients if the two subscales are used in the same analysis (Gordon, 1968). Therefore, Bekkers et al. (1996) suggested that the two subscales be used separately. Since our focus was on patients' stoma care ability, we used the 13-item Stoma Care Self-efficacy. The Cronbach's alpha for the original version of the Stoma Care SE was 0.94, the Chinese version was 0.97 (Wu, Chau, & Twinn, 2007). In this study, the Cronbach's alpha was 0.97.

3.7 | Validity, reliability, and rigour

To minimize the threats of common methods bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), data confidentiality and anonymity were guaranteed. After data collection, we examined the data to check for missing data, outliers, and common methods bias (CMB). There were no missing data and outliers, the data distribution of all variables was normal distribution. CMB was examined by Harman's single factor test (Miguel & Jiang, 2019). Constraining the number of factors extracted to one, exploratory factor analysis yielded one single factor explaining 33.755% of the variance, lower than 50%, indicating there were no common method bias. Besides, all questionnaires used in this study were Chinese versions and the internally consistent reliability were acceptable.

3.8 | Data analysis

IBM SPSS Statistics version 24.0 was used to perform all data analysis. We calculated the percentages of participants in the various categories, means and SDs. Pearson correlation coefficients were calculated to explore the associations among variables. Finally, a mediation analysis was performed with Hayes's PROCESS macro in SPSS (Hayes, 2013) to explore the mediating effects. The mediating effect is assessed based on indirect effect of X (explanatory variable) on Y (response variable) through *M* (the mediators), which can

be significant regardless of the significance of the total effect (the effect of X on Y) and the direct effect (the effect on Y when both X and M are included as predictors). In our test, the mediating effect was examined using the bootstrap method (5,000 samples) with bias-corrected 95% confidence intervals (CIs). The mediation effect is statistically significant if zero is not contained in the CI between the upper and lower bound.

4 | RESULTS

4.1 | Descriptive and reliability

The means, SDs, and Cronbach's alpha coefficients for our composite variables are presented in Table 2. All of our composite variables demonstrated acceptable levels of internal reliability.

4.2 | Correlation analysis

The results of the Pearson's correlation analyses are displayed in Table 3. The results revealed that gender showed only negative and low associations with stoma care self-efficacy. Stoma-related negative symptoms and duration of stoma implantation were not significantly related to the other variables. Stoma acceptance was significantly negatively associated with personal disgust, behavioural disgust, and stigma and significantly positively associated with stoma care self-efficacy. Stigma was significantly positively associated with personal disgust and behavioural disgust. Finally, stoma care self-efficacy was significantly negatively associated with personal disgust, behavioural disgust, and stigma.

4.3 | Mediation analysis

With PROCESS, we examined whether the relationship between stoma acceptance (X) and stoma care self-efficacy (Y) was mediated by self-disgust (M1: personal disgust; M2: behavioural disgust) and stigma (M2). Table 4 shows the unstandardized regression coefficients (B) with the standard errors (SEs) and CIs (in parentheses) to estimate self-disgust and stigma (mediators) and stoma care self-efficacy. We used the PROCESS macro V3.4 and mediation model 4 (parallel mediation) to analyse the indirect effect, assuming that personal disgust, behavioural disgust, and stigma were parallel. First, the total effect of stoma acceptance on stoma care self-efficacy showed that a one-unit increase in the stoma acceptance score was associated with an average 0.76-unit increase in the stoma care self-efficacy score (95% CI [0.69, 0.83]). Personal disgust and stigma were also significantly associated with stoma care self-efficacy. In particular, a one-unit increase in the personal disgust score was associated with a − 0.52-unit increase (95% CI [−0.59, −0.45]) in the stoma care self-efficacy score and a one-unit increase in the stigma score led to a − 0.40-unit increase (95% CI [−0.48, −0.32]) in the stoma care self-efficacy score. Behavioural disgust was not significantly associated with stoma care self-efficacy. The results showed that the total indirect effect of stoma acceptance on stoma care self-efficacy through personal disgust, behavioural disgust, and stigma was 0.47 (95% CI [0.41, 0.55]), from which the indirect effect of stoma acceptance on stoma care self-efficacy through personal disgust was 0.40 (95% CI [0.33, 0.47]) and through stigma was 0.08 (95% CI [0.06, 0.12]). The CIs for these indirect effects did not include zero, suggesting significant indirect effects through personal disgust and stigma mediators. The indirect effect of stoma acceptance on stoma care self-efficacy through behavioural disgust was − 0.01 (95% CI [−0.04, 0.02]). The CIs for this indirect effect included zero, suggesting non-significant indirect effects through behavioural disgust. There was a significant effect of sex on stoma care self-efficacy as a covariate and the CIs did not include zero (−0.08, 95% CI [−0.16, −0.01]). There was a significant effect of stoma-related negative symptoms on stoma care self-efficacy as a covariate and the CIs did not include zero (−0.07, 95% CI [−0.13, −0.01]). There was no significant effect of duration of stoma implantation on stoma care self-efficacy as a covariate and the CIs include zero (0.03, 95% CI [−0.01, 0.07]). The mediating effect of personal disgust was significantly higher than that of stigma (0.31, 95% CI [0.24, 0.39]).

TABLE 2 Descriptive statistics and reliability among all variables

Variable	Mean	*SD*	Cronbach's alpha
Stoma-related negative symptom	3.006	0.525	
Stoma acceptance	2.891	0.525	0.893
Stigma	2.455	0.357	0.926
Personal disgust	3.029	0.619	0.944
Behavioural disgust	3.076	0.561	0.850
Stoma care self-efficacy	2.894	0.582	0.972

5 | DISCUSSION

5.1 | Summary of findings

Patients with colostomies have to cope with many challenges in impaired self-image, abnormal bowel function, and serious psychological distress. Colostomy acceptance and effective stoma management can aid patients in the return to a full and active life. Besides, emotional response and, to a lesser extent, disease factors may also affect the stoma management, suggesting that addressing these issues should also be an important part of patient care.

In this paper, we explored the relationship between stoma acceptance, self-disgust, stigma, and stoma care self-efficacy in patients with colostomy. Our first prediction, (1) stoma acceptance would be positively related to stoma care self-efficacy and negatively related to self-disgust and stigma, was supported. This result mirrors the results found in previous studies with patients with colostomy showing that stoma acceptance was related to self-efficacy

TABLE 3 Correlations among all variables

	1	2	3	4	5	6	7	8
1. Gender	1	−0.047	−0.040	0.059	0.002	−0.025	−0.094*	−0.047
2. Stoma-related negative symptom		1	−0.004	−0.024	0.010	0.001	−0.019	−0.080
3. Duration of stoma implantation			1	−0.067	−0.015	0.058	0.021	−0.012
4. Stoma acceptance				1	−0.309***	−0.640***	−0.384***	0.689***
5. Stigma					1	0.200***	0.127***	−0.441***
6. Personal disgust						1	0.611**	−0.761***
7. Behavioural disgust							1	−0.453***
8. Stoma care self-efficacy								1

*$p < .05$.
**$p < .01$.
***$p < .001$.

and stigma (Simmons et al., 2007; Yuan et al., 2018). The correlation between stoma acceptance and self-disgust was confirmed for the first time in this study and it supports acceptance as a predictor of patients' emotional disorders and psychological well-being (Kotsou, Leys, & Fossion, 2018). There are at least two reasons why stoma acceptance may be especially associated with self-disgust, stigma, and self-efficacy. First, people with higher self-acceptance are less fearful of public discrimination and rejection (Kilic, Taycan, Belli, & Ozmen, 2007). A positive perception of one's own situation helps reduce negative emotions and aversive self-conscious feelings (Kotsou et al., 2018). Second, the reconstruction of self-worth leads to a positive coping style (Ferrin, Fong, Chronister, & Chiu, 2010), leading to more control over the colostomy and better stoma management. Besides, in our study, gender was associated with stoma care self-efficacy. This finding is in accordance with Wu et al. (2007), but is not consistent with the result of Mystakidou et al. (2010). The correlation between gender and self-efficacy revealed in our study may be due to the social and family roles of men that determine the strength and confidence of stoma control. Nevertheless, considering the opposing views, the association between gender and issues related to stoma still seems a complexity and entails further investigation. Furthermore, it should be noted that contrary to our expectations, duration of stoma implantation and stoma-related negative symptoms were not related to other variable, although some literature indicated that most stoma-related problems occur within the first 3 months and the complications would affect the quality of life (Kwiatt & Kawata, 2013; Sarkar, 2018; Thorpe, Arthur, & McArthur, 2016). In our study, most patients' duration of stoma were more than 6 months, self-acceptance, and management might increase as patients have repeated experiences with the stoma, resulting in no significant difference between the two variables and other variables. We speculate that the severity of symptoms may be a better indicator than the number of symptoms, which needs our further verification in future research.

Predictions (2) and (3) were supported by the mediation model (Figure 1). Personal disgust and stigma had significant mediating effects on stoma acceptance and stoma care self-efficacy. Patients with lower stoma acceptance had higher self-disgust and higher levels of perceived stigmatization – they appeared to assume that others would be disgusted by their colostomies. The two factors were strong negative predictors of stoma care self-efficacy in turn. This finding is consistent with the idea that acceptance is a central factor in the onset and maintenance of emotional disorders (Kotsou et al., 2018). Patients who do not accept stomas could exacerbate negative perception, resulting in aversive self-conscious feelings and therefore are more likely to perceive public discrimination. Besides, psychological states (especially positive emotional factors) have been associated with the ability to successfully reconstitute meaning in life (Johnson Vickberg et al., 2001; Ong, Bergeman, Bisconti, & Wallace, 2006), such as a greater sense of mastery (self-efficacy; Hao et al., 2020), optimism (Yang, Li, Liu, & Wang, 2018), and self-esteem (Izydorczyk, Kwapniewska, Lizinczyk, & Sitnik-Warchulska, 2018). Given the effect of emotional adjustment on coping styles (e.g., disgust tends to elicit the avoidance or rejection; Powell et al., 2013), it is not surprising that patients who experience internal disgust and perceived external stigma due to the stoma reported lower levels of stoma care self-efficacy. The evidence of the relationship between the above four variables could encourage stoma therapists and clinical nurses to consider emotional factors like self-disgust and stigma when aiming to improve stoma self-care and management.

Prediction (3) was partially supported. We have observed that behavioural disgust had no mediating effect on stoma acceptance and stoma care self-efficacy and the mediating effect of personal disgust was larger than that of stigma. We speculated that, based on the particularities of colostomy, such as problems with body products (e.g., faeces), impaired self-image, poor hygiene (e.g., unpleasant odour), and sickness, patients with colostomy would regard their environments or even themselves as a source of contamination; such personal disgust, rather than behavioural disgust, is typically the basis of self-disgust. In addition, we expected that perceived stigmatization by others would increase the patients' self-disgust. The finding that personal disgust had a greater effect than behavioural

TABLE 4 The unstandardized regression coefficients(B) with Standard Errors (SE) and 95% confidence intervals (CI) (in parentheses) estimating personal disgust, behavioural disgust and stigma (M), and stoma care self-efficacy (Y)

	M1A			M1B			M2			Y		
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI
Constant	5.250	0.187	[4.882,5.618]	4.392	0.204	[3.992,4.793]	3.077	0.134	[2.814,3.339]	4.785	0.243	[4.309,5.262]
X	−0.757	0.042	[−0.839, −0.674]	−0.414	0.046	[−0.503, −0.324]	−0.211	0.030	[−0.270, −0.152]	0.288	0.037	[0.216,0.360]
G	−0.030	0.044	[−0.116,0.057]	−0.047	0.048	[−0.141,0.047]	0.033	0.031	[−0.029,0.095]	−0.522	0.035	[−0.591, −0.453]
S	−0.015	0.037	[−0.087,0.057]	−0.028	0.040	[−0.106,0.050]	0.003	0.026	[−0.048,0.054]	0.014	0.032	[−0.049,0.078]
D	0.013	0.031	[−0.048,0.073]	−0.005	0.034	[−0.071,0.062]	−0.017	0.022	[−0.061,0.026]	−0.401	0.042	[−0.484, −0.318]
M1A										−0.082	0.029	[−0.139, −0.026]
M1B										−0.071	0.024	[−0.118, −0.024]
M2										0.026	0.020	[−0.014,0.066]
R2	0.411			0.150			0.099			0.717		
F-ratio	(4,471) 82.229 $p < .001$			(4,471) 20.813 $p < .001$			(4,471)12.950 $p < .001$			(7,468) 169.050 $p < .001$		

Note.: Abbreviations: D, Duration of stoma implantation;G, gender; M1A, Personal disgust; M1B, Behavioural disgust; M2, Stigma; S, Stoma-related negative symptom; X, Stoma acceptance; Y, Stoma care self-efficacy.
Effects are significant when the upper and lower bound of the bias-corrected 95% confidence intervals (CI) does not contain zero.

disgust on patients with colostomy was consistent with a study with limb amputees (Burden, Simpson, Murray, Overton, & Powell, 2018). The main reason is that for this type of patients, the primary change to the self is physical rather than one's character or behavioural standards. These findings suggest that it is important to distinguish between personal disgust and behavioural disgust when investigating the relationship between self-disgust and mental health. It also reminds the stoma nurses to focus on the patient's disgust directed towards their own physical appearance and personality when formulating the care plans and interventions.

5.2 | Practical and research implications

The findings from this study have implications for understanding the impact of psychological factors on stoma self-efficacy in patients with colostomy and contribute to the literature on the importance of addressing emotional factors in self-management. This work suggests that a reluctance for stoma acceptance may have particularly adverse effect on stoma care self-efficacy through increases in self-disgust and stigma. There are two potential points for intervention. First, before a colostomy, expected stoma acceptance can be measured by stoma therapists and clinical nurses to determine which patients may particularly suffer as a result of the stoma to be able to monitor and treat them accordingly. There is evidence that acceptance is a central trans-diagnostic process that explains a large proportion of variance in mood disorders and is associated with coping and emotion regulation strategies (Kashdan, Barrios, Forsyth, & Steger, 2006). Therefore, improving the acceptance abilities of patients may be a promising intervention for promoting psychological and physical health. Second, reducing self-disgust and stigma may be a useful strategy for improving a patient's ability to manage the stoma. Recent experimental work has shown that dispositional mindfulness encourages people to pay more attention to the present moment, which inspires them to redefine the meanings of disaster, life, and the self and establish more trust in their own strength (Kabat-Zinn, 2003; Xu, Ding, Goh, & An, 2018). However, research on the effective regulation and treatment of self-disgust and stigma is still in its infancy and there are plentiful opportunities for future work in this field. At the clinical level, our results suggest that regardless of the type of intervention, it is essential that emotional components (e.g., acceptance, disgust, and stigma) are the main focuses of clinical intervention.

5.3 | Limitations and directions for future research

Although the results of the present work had several strengths, some limitations must be addressed to indicate several avenues for future research. The first limitation of the research is that it relied entirely on participants' self-report measures, which may be biased and thus influencing our results. Especially for measuring stoma-related negative symptoms, although we listed as many stoma-related negatives

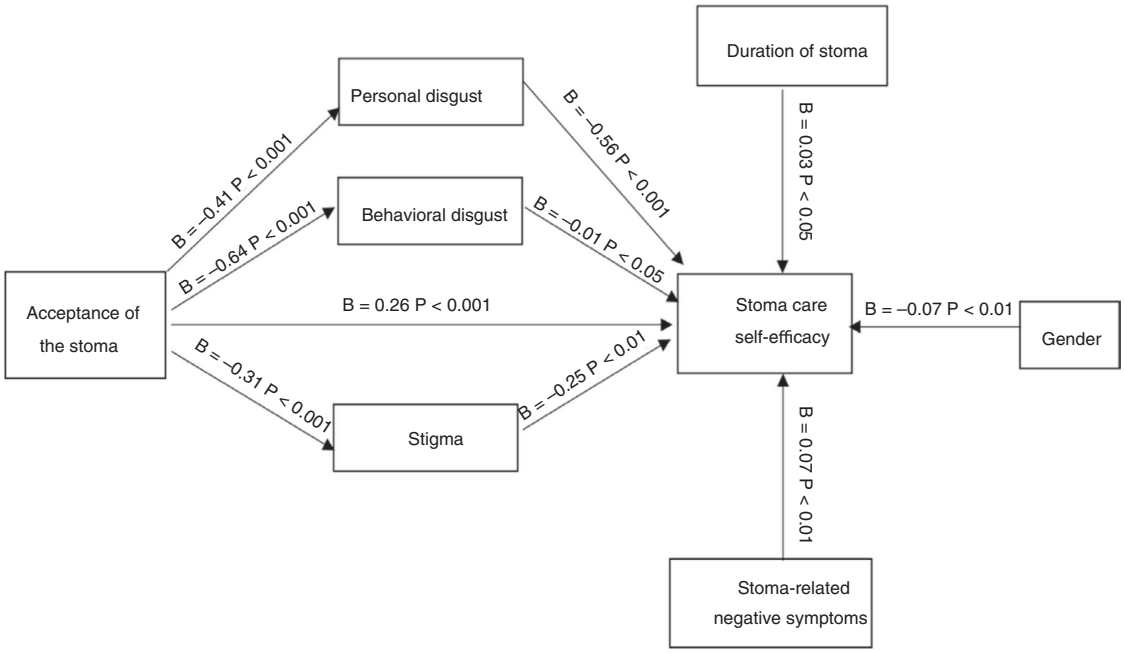

FIGURE 1 Graphic representation of the Mediation Model ($N = 476$).

symptoms as possible and made the final code based on the judgement of clinical staff, all the results still depend on participants' self-report, which may weaken their validity and accuracy and reduce the generalizability of the findings. Additionally, since self-disgust may share commonalities with self-directed negative emotions (Simpson, Hillman, Crawford, & Overton, 2010), it is difficult to determine whether the self-disgust as measured in this study includes other emotions, such as self-criticism and self-hatred. These aspects should be considered in future studies, as they may influence the findings. Finally, the model tested in this study was limited, as it is likely that other variables (e.g., optimism, social support, or body dissatisfaction) may be involved in the relationships between stoma acceptance, self-disgust, stigma, and stoma care self-efficiency. Due to time constraints and collaboration issues, we were unable to exhaust all potential confounders in our study. Therefore, a more rigorous research design should be adopted to actively exclude or control confounding variables including randomization, restriction, and matching (Pourhoseingholi, Baghestani, & Vahedi, 2012). Future research could include observational and intervention studies to investigate the causality among these variables.

6 | CONCLUSIONS

The current study was the first to quantitatively explore the effects of stoma acceptance, self-disgust, and stigma on stoma care self-efficacy. The findings showed that the patients with colostomy with lower stoma acceptance exhibited lower levels of self-efficacy. Moreover, the association could be explained entirely by increases in self-disgust and stigma. Although we have focused on colostomy, this association may also be related to other physical health conditions, such as incontinence and amputation. Taken together, these findings highlight the importance of emotional factors in stoma self-efficacy. They suggest that interventions that target emotion may be useful in improving the ability of self-management ability of patients with colostomy, which may provide a new direction for stoma therapists in colostomy care.

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REFERENCES

Ang, S. G., Chen, H. C., Siah, R. J., He, H. G., & Klainin-Yobas, P. (2013). Stressors Relating to Patient Psychological Health Following Stoma Surgery: An Integrated Literature Review. *Oncology Nursing Forum*, *40*(6), 587–594. https://doi.org/10.1188/13.ONF.587-594

Arnold, M., Sierra, M. S., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2017). Global patterns and trends in colorectal cancer

incidence and mortality. *Gut*, *66*(4), 683. https://doi.org/10.1136/gutjnl-2015-310912

Azlan, H. A., Overton, P. G., Simpson, J., & Powell, P. A. (2017a). Differential. disgust responding in people with cancer and implications for psychological wellbeing. *Psychology & Health*, *32*(1), 19–37. https://doi.org/10.1080/08870446.2016.1235165

Azlan, H. A., Overton, P. G., Simpson, J., & Powell, P. A. (2017b). Effect of partners' disgust responses on psychological wellbeing in cancer patients. *Journal of Clinical Psychology in Medical Settings*, *24*, 355–364. https://doi.org/10.1007/s10880-017-9521-z

Baxter, A., & Salter, M. (2000). Stoma care nursing. *Nursing Standard*, *14*, 59. https://doi.org/10.7748/ns2000.01.14.19.59.c2749

Bekkers, M. J. T. M., Van Knippenberg, F. C. E., Van Den Borne, H. W., & Van Berge-Henegouwen, G. P. (1996). Prospective Evaluation of Psychosocial Adaption to Stoma Surgery: T*he Role of Self-Efficacy*. *Psychosomatic Medicine*, *58*(2). https://doi.org/10.1097/00006842-199603000-00013

Burch, J. (2013). Care of patients with a stoma. *Nursing Standard*, *27*(32), 49–56. https://doi.org/10.7748/ns2013.04.27.32.49.e7347

Burch, J. (2017). Care of patients undergoing stoma formation: What the nurse needs to know. *Nursing Standard*, *31*(41), 40–45. https://doi.org/10.7748/ns.2017.e10177

Burden, N., Simpson, J., Murray, C., Overton, P. G., & Powell, P. A. (2018). Prosthesis use is associated with reduced physical self-disgust in limb amputees. *Body Image*, *27*, 109–117. https://doi.org/10.1016/j.bodyim.2018.08.001

Capilla-Díaz, C., Bonill-de las Nieves, C., Hernández-Zambrano, S. M., Montoya-Juárez, R., Morales-Asencio, J. M., Pérez-Marfil, M. N., & Hueso-Montoro, C. (2019). Living with an intestinal stoma: A qualitative systematic review. *Qualitative Health Research*, *29*(9), 1255–1265. https://doi.org/10.1177/1049732318820933

Chen, W., Zheng, R., Baade, P. D., Zhang, S., Zeng, H., Bray, F., & He, J. (2016). Cancer statistics in China, 2015. *CA: A Cancer Journal for Clinicians*, *66*(2), 115–132. https://doi.org/10.3322/caac.21338.

de la Encarnacion, O. C. (2019). Impact on quality of life and importance of stoma care in patients with ostomy complications. *Revista Rol De Enfermeria*, *42*(4), 60–63.

Dovidio, J. F., Major, B., & Crocker, J. (2000). Stigma: Introduction and overview. In T. F. Heatherton, R. E. Kleck, M. R. Hebl, & J. G. Hull (Ed.), *The social psychology of stigma* (pp. 1–28). New York, NY, US: Guilford Press.

Espeset, E. M. S., Gulliksen, K. S., Nordbø, R. H. S., Skårderud, F., & Holte, A. (2012). The link between negative emotions and eating disorder behaviour in patients with anorexia nervosa. *European Eating Disorders Review*, *20*(6), 451–460. https://doi.org/10.1002/erv.2183

Felton e.a. (1984). *Accepance of Illness Scale*. Berkshire: In Measures in Health Psychology.

Ferrin, J. M., Fong, C., Chronister, J., & Chiu, C.-Y. (2010). Psychometric validation of the Multidimensional Acceptance of Loss Scale. *Clinical Rehabilitation*, *25*(2), 166–174. https://doi.org/10.1177/0269215510380836

Fife, B. L., & Wright, E. R. (2000). The dimensionality of stigma: A. comparison of its impact on the self of persons with HIV/AIDS and cancer. *Journal of Health and Social Behavior*, *41*(1), 50–67. https://doi.org/10.2307/2676360

Gautam, S., & Poudel, A. (2016). Effect of gender on psychosocial adjustment of colorectal cancer survivors with ostomy. *Journal of Gastrointestinal Oncology*, *7*(6), 938–945. https://doi.org/10.21037/jgo.2016.09.02

Gilbert, P. (2005). *Compassion: Conceptualizations*, *research and use in*. Psychotherapy: Routledge.

Gilbert, P. (2015). Self-Disgust, Self-Hatred and Compassion Focused Therapy. In P. A. Powell, P. G. Overton, & J. Simpson (Eds.), *The revolting self: Perspectives on the Psychological*, *Social and Clinical Implications of Self-Directed Disgust*. London: Karnac Books.

Gordon, R. A. (1968). Issues in Multiple Regression. *American Journal of Sociology*, *73*(5), 592–616. https://doi.org/10.1086/224533

Grant, M., McCorkle, R., Hornbrook, M. C., Wendel, C. S., & Krouse, R. (2013). Development of a Chronic Care Ostomy Self-Management Program. *Journal of Cancer Education*, *28*(1), 70–78. https://doi.org/10.1007/s13187-012-0433-1

Grant, M., McMullen, C. K., Altschuler, A., Mohler, M. J., Hornbrook, M. C., Herrinton, L. J., … Krouse, R. S. (2011). Gender differences in quality of life among long-term colorectal cancer survivors with ostomies. *Oncology Nursing Forum*, *38*(5), 587–596. https://doi.org/10.1188/11.ONF.587-596

Hao, Y.-J., Sun, H.-B., Li, H.-W., Chen, B.-J., Chen, X.-L., Ma, L., & Li, Y.-L. (2020). Application of positive behavior management in patients after breast cancer surgery. *World Journal of Clinical Cases*, *8*(4), 689–699. https://doi.org/10.12998/wjcc.v8.i4.689

Ille, R., Schögglb, H., Kapfhammer, H., Arendasy, M., Sommer, M., & Schienle, A. (2014). Self-disgust in mental disorders—symptom-related or disorder-specific? *Comprehensive Psychiatry*, *55*, 938–943. https://doi.org/10.1016/j.comppsych.2013.12.020

Izydorczyk, B., Kwapniewska, A., Lizinczyk, S., & Sitnik-Warchulska, K. (2018). Psychological Resilience as a Protective Factor for the Body Image in Post-Mastectomy Women with Breast. *Cancer. International Journal of Environmental Research and Public Health*, *15*(6), https://doi.org/10.3390/ijerph15061181

Jiang, X. H., Lai, N. S., Livenh, H., Ye, M. L., & Cai, Z. Y. (2013). 中文版简式疾病接受度量表之信效度检定. [Validity and Reliability of Chinese Version of Acceptance of Disability Scale-Revised]. 志为护理,*12*(1):66–76.

Jin, Y. F., Li, Y. F., Gutiérrez-Colón, M., & Jiménez-Herrera, M. (2020). Questionnaire for the assessment of self-disgust: The psychometric testing among mental disorders in China. *Clinical Psychology & Psychotherapy*. https://.doi.org/10.1002/cpp.2459

Jin, Y. F., Xiong, L. N., Gao, F., & Jin, C. D. (2016). 中文版自我厌恶感量表的信效度检验. [Validity and Reliability of Chinese Version of Questionnaire for the Assessment of Self-Disgust]. 护理学杂志,*31*(03):80–83.

Johnson Vickberg, S. M., Duhamel, K. N., Smith, M. Y., Manne, S. L., Winkel, G., Papadopoulos, E. B., & Redd, W. H. (2001). Global meaning and psychological adjustment among survivors of bone marrow transplant. *Psycho-Oncology*, *10*(1), 29–39. https://doi.org/10.1002/10991611(200101/02)10:1<29:AID-PON482>3.0.CO;2-Y

Kabat-Zinn, J. (2003). Mindfulness-Based Interventions in Context: Past, Present and Future. *Clinical Psychology: Science and Practice*, *10*(2), 144–156. https://doi.org/10.1093/clipsy.bpg016

Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy*, *44*(9), 1301–1320. https://doi.org/10.1016/j.brat.2005.10.003

Kilic, E., Taycan, O., Belli, A. K., & Ozmen, M. (2007). The effect of permanent ostomy on body image, self-esteem, marital adjustment and sexual functioning]. *Turk Psikiyatri Derg*, *18*(4), 302–310.

Knowles, S. R., Tribbick, D., Connell, W. R., Castle, D., Salzberg, M., & Kamm, M. A. (2017). Exploration of Health Status, Illness Perceptions, Coping Strategies, Psychological Morbidity and Quality of Life in Individuals With Fecal Ostomies. *Journal of Wound Ostomy and Continence Nursing*, *44*(1), 69–73. https://doi.org/10.1097/WON.0000000000000295

Koc, U., Karaman, K., Gomceli, I., Dalgic, T., Ozer, I., Ulas, M., … Akoglu, M. (2017). A Retrospective Analysis of Factors Affecting Early Stoma Complications. *Ostomy/wound Management*, *63*(1), 28–32.

Kotsou, I., Leys, C., & Fossion, P. (2018). Acceptance alone is a better predictor of psychopathology and well-being than emotional competence, emotion regulation and mindfulness. *Journal of Affective Disorders*, *226*, 142–145. https://doi.org/10.1016/j.jad.2017.09.047

Krishnamurty, D. M., Blatnik, J., & Mutch, M. (2017). Stoma Complications. *Clinics in Colon and Rectal Surgery*, *30*(3), 193–200. https://doi.org/10.1055/s-0037-1598160

Krouse, R. S., Grant, M., McCorkle, R., Wendel, C. S., Cobb, M. D., Tallman, N. J., … Hornbrook, M. C. (2016). A chronic care ostomy self-management program for cancer survivors. *Psycho-Oncology*, *25*(5), 574–581. https://doi.org/10.1002/pon.4078

Krouse, R. S., Grant, M., Rawl, S. M., Mohler, M. J., Baldwin, C. M., Coons, S. J., … Ko, C. Y. (2009). Coping and acceptance: The greatest challenge for veterans with intestinal stomas. *Journal of Psychosomatic Research*, *66*(3), 227–233. https://doi.org/10.1016/j.jpsychores.2008.09.009

Kwiatt, M., & Kawata, M. (2013). Avoidance and management of stomal complications. *Clinics in Colon and Rectal Surgery*, *26*(2), 112–121. https://doi.org/10.1055/s-0033-1348050

Lundgren, T., Dahl, J., Melin, L., & Kies, B. (2006). Evaluation of Acceptance and Commitment Therapy for Drug Refractory Epilepsy: A Randomized Controlled Trial in South Africa—A Pilot Study. *Epilepsia*, *47*(12), 2173–2179. https://doi.org/10.1111/j.1528-1167.2006.00892.x

Miguel, I.-A.-U., & Jiang, H. (2019). Detecting Common Method Bias: Performance of the Harman's Single-Factor Test. *SIGMIS Database*, *50*(2), 45–70. https://doi.org/10.1145/3330472.3330477

Mystakidou, K., Tsilika, E., Parpa, E., Gogou, P., Theodorakis, P., & Vlahos, L. (2010). Self-efficacy beliefs and levels of anxiety in advanced cancer patients. *European Journal of Cancer Care*, *19*(2), 205–211. https://doi.org/10.1111/j.1365-2354.2008.01039.x

Nicholls, E., Lehan, T., Plaza, S. L. O., Deng, X., Romero, J. L. P., Pizarro, J. A. A., & Carlos Arango-Lasprilla, J. (2012). Factors influencing acceptance of disability in individuals with spinal cord injury in Neiva, Colombia, South America. *Disability and Rehabilitation*, *34*(13), 1082–1088. https://doi.org/10.3109/09638288.2011.631684

Nowicki, A., Marciniak, J., Farbicka, P., & Banaszkiewicz, Z. (2015). Satisfaction With Life And Disease Acceptance By Patients With A Stomy Related To Surgical Treatment Of The Rectal Cancer-Determinants Of Quality Of Life? *Polski Przeglad Chirurgiczny*, *87*(9), 434–442. https://doi.org/10.1515/pjs-2015-0085

Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological resilience, positive emotions and successful adaptation to stress in later life. *Journal of Personality and Social Psychology*, *91*(4), 730–749. https://doi.org/10.1037/0022-3514.91.4.730

Overton, P. G., Markland, F. E., Taggart, H. S., Bagshaw, G. L., & Simpson, J. (2008). Self-disgust mediates the relationship between dysfunctional cognitions and depressive symptomatology. *Emotion*, *8*, 379–385. https://doi.org/10.1037/1528-3542.8.3.379

Piwonka, M. A., & Merino, J. (1999). A multidimensional modeling of predictors influencing the adjustment to a colostomy. *Journal of WOCN*, *26*(6), 298–305. https://doi.org/10.1016/S1071-5754(99)90065-7

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Pourhoseingholi, M. A., Baghestani, A. R., & Vahedi, M. (2012). How to control confounding effects by statistical analysis. *Gastroenterology and Hepatology from Bed to Bench*, *5*(2), 79–83.

Powell, P. A., Azlan, H. A., Simpson, J., & Overton, P. G. (2016). The effect of disgust-related side-effects on symptoms of depression and anxiety in people treated for cancer: A moderated mediation model. *Journal of Behavioral Medicine*, *39*(4), 560–573. https://doi.org/10.1007/s10865-016-9731-0

Powell, P. A., Overton, P. G., & Simpson, J. (2014). The revolting self: An interpretative phenomenological analysis of the experience of self-disgust in females with depressive symptoms. *Journal of Clinical Psychology*, *70*(6), 562–578. https://doi.org/10.1002/jclp.22049

Powell, P. A., Simpson, J., & Overton, P. G. (2013). When disgust leads to dysphoria: A three-wave longitudinal study assessing the temporal. relationship between self-disgust and depressive symptoms. *Cognition & Emotion*, *27*(5), 900–913. https://doi.org/10.1080/02699931.2013.767223

Powell, P. A., Simpson, J., & Overton, P. G. (2015). An introduction to the. revolting self: Self-disgust as an emotion schema. In P. A. Powell, P. G. Overton, & J. Simpson (Eds.), *The revolting self: Perspectives on the Psychological, Social and Clinical Implications of Self-Directed Disgust*. London: Karnac Books.

Reynolds, L. M., Bissett, I. P., & Consedine, N. S. (2015). Predicting the patients who will struggle with anal incontinence: Sensitivity to disgust matters. *Colorectal Disease*, *17*(1), 73–80. https://doi.org/10.1111/codi.12781

Sarkar, S. (2018). Quality life outcomes in patients with colostomy and ileostomy, with reference to psychosocial problems and surgical complications. *Journal of Evolution of Medical and Dental Sciences-Jemds*, *7*(49), 5292–5297. https://doi.org/10.14260/jemds/2018/1173

Schienle, A., Ille, R., Sommer, M., & Arendasy, M. (2014). Diagnosis of self-disgust in the context of depression. *Verhaltenstherapie*, *24*(1), 15–20. https://doi.org/10.1159/000360189

Seo, H. W. (2019). Effects of the frequency of ostomy management reinforcement education on self-care knowledge, self-efficacy and ability of stoma appliance change among Korean hospitalised ostomates. *International Wound Journal*, *16*, 21–28. https://doi.org/10.1111/iwj.13047

Shanmugarajah, K., Gaind, S., Clarke, A., & Butler, P. E. M. (2012). The role of disgust emotions in the observer response to facial disfigurement. *Body Image*, *9*(4), 455–461. https://doi.org/10.1016/j.bodyim.2012.05.003

Sheeran, P., Maki, A., Montanaro, E., Avishai-Yitshak, A., Bryan, A., Klein, W. M. P., … Rothman, A. J. (2016). The impact of changing attitudes, norms and self-efficacy on health-related intentions and behavior: A meta-analysis. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, *35*(11), 1178–1188. https://doi.org/10.1037/hea0000387

Shen, Q. Z., Mou, S. Y., Wang, X. H., & Liu, Y. (2017). 中文版社会影响量表应用于肠造口患者病耻感的信效度测评. [Reliability and validity of Chinese version of social impact scale applied in study of stigma in colostomy patients]. 重庆医科大学学报,*42*(09):1188–1192.

Simmons, K. L., Smith, J. A., Bobb, K.-A., & Liles, L. L. M. (2007). Adjustment to colostomy: Stoma acceptance, stoma care self-efficacy and interpersonal relationships. *Journal of Advanced Nursing*, *60*(6), 627–635. https://doi.org/10.1111/j.1365-2648.2007.04446.x

Simpson, J., Hillman, R., Crawford, T., & Overton, P. G. (2010). Self-esteem. and self-disgust both mediate the relationship between dysfunctional cognitions and depressive symptoms. *Motivation and Emotion*, *34*(4), 399–406. https://doi.org/10.1007/s11031-010-9189-2

Smith, D. M., Loewenstein, G., Rozin, P., Sherriff, R. L., & Ubel, P. A. (2007). Sensitivity to disgust, stigma and adjustment to life with a colostomy. *Journal of Research in Personality*, *41*(4), 787–803. https://doi.org/10.1016/j.jrp.2006.09.006

Steinhagen, E., Colwell, J., & Cannon, L. M. (2017). Intestinal Stomas-Postoperative Stoma Care and Peristomal Skin Complications. *Clinics in Colon and Rectal Surgery*, *30*(3), 184–192. https://doi.org/10.1055/s-0037-1598159

Stuifbergen, A. K., Seraphine, A., & Roberts, G. (2000). An Explanatory Model of Health Promotion and Quality of Life in Chronic Disabling Conditions. *Nursing Research*, *49*(3). https://doi.org/10.1097/00006199-200005000-00002

Szpilewska, K., Juzwiszyn, J., Bolanowska, Z., Milan, M., Chabowski, M., & Janczak, D. (2018). Acceptance of disease and the quality of life in patients with enteric stoma; Pol Przegl Chir, *90*(1):13–17. https://doi.org/10.5604/01.3001.0011.5954

Thorpe, G., Arthur, A., & McArthur, M. (2016). Adjusting to bodily change following stoma formation: A phenomenological study. *Disability and Rehabilitation*, *38*(18), 1791–1802. https://doi.org/10.3109/09638288.2015.1107768

Vonk-Klaassen, S. M., de Vocht, H. M., den Ouden, M. E. M., Eddes, E. H., & Schuurmans, M. J. (2016). Ostomy-related problems and their impact on quality of life of colorectal cancer ostomates: A systematic review. *Quality of Life Research*, *25*(1), 125–133. https://doi.org/10.1007/s11136-015-1050-3

Wu, H.-K.-M., Chau, J.-P.-C., & Twinn, S. (2007). Self-efficacy and Quality of. Life Among Stoma Patients in Hong Kong. *Cancer Nursing*, *30*(3), https://doi.org/10.1097/01.NCC.0000270704.34296.86

Xu, W., Ding, X., Goh, P. H., & An, Y. (2018). Dispositional mindfulness moderates the relationship between depression and posttraumatic growth in Chinese adolescents following a tornado. *Personality and Individual Differences*, *127*, 15–21. https://doi.org/10.1016/j.paid.2018.01.032

Yang, Y. L., Li, M. Y., Liu, L., & Wang, L. (2018). Perceived stress and its associated demographic-clinical characteristics and positive expectations among Chinese cervical, kidney and bladder cancer patients. *Supportive Care in Cancer*, *26*(7), 2303–2312. https://doi.org/10.1007/s00520-018-4081-9

Yuan, J. M., Zhang, J. E., Zheng, M. C., & Bu, X. Q. (2018). Stigma and its influencing factors among Chinese patients with stoma. *Psycho-Oncology*, *27*(6), 1565–1571. https://doi.org/10.1002/pon.4695

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Addendum Nº3(Original article)

UNIVERSITAT ROVIRA I VIRGILI
SELF-DISGUST IN CHINESE PATIENTS WITH COLOSTOMY: AN EXPLORATORY STUDY
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ORIGINAL ARTICLE

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Development and psychometric evaluation of the colostomy disgust scale in patients with colostomy

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Abstract

Objective: To establish and validate the Colostomy Disgust Scale (CDS) for assessing disgust in colostomy patients.

Design: Triphasic, cross-sectional psychometric study.

Setting: A total of 423 patients with colostomy (222 first samples and 201 s samples) were recruited from a tertiary hospital between January 2015 and April 2016.

Methods: Three phases were undertaken: (a) item generation, (b) item selection and (c) evaluation and validation. The evaluation and validation of the CDS were performed through feasibility and initial item analysis, exploratory factor analysis, confirmatory factor analysis and internal consistency.

Results: Following item generation and item selection, a 22-item CDS was generated. Principal axis factoring indicated a two-factor solution for the proposed CDS model, which was also verified by confirmatory factor analysis. Moreover, the proposed CDS had a high internal consistency.

Conclusion: The CDS is a self-report instrument with initial evidence for its validity and reliability. It is a promising tool to identify the triggers of disgust in colostomy contexts, which can be of great importance for promoting the mental health of colostomy patients.

KEYWORDS

colostomy, disgust, mental health, reliability, scale development, validity

1 | INTRODUCTION

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the fourth leading cause of cancer-related deaths around the world (Arnold et al., 2017; Ferlay et al., 2008; World Cancer Research Fund International, 2012). Colostomy, an operation that creates an opening for the colon through the abdomen, still serves as the life-saving treatment for CRC, accounting for approximately 750,000 colostomy patients with permanent stomas in the USA, 100,000 in the UK and 1,000,000 in China (Ma desen, 2006). This effective treatment has improved the 5-year relative survival rate of CRC patients. However, as the life expectancy of colostomy patients has increased, their mental health has become a growing area of concern for managing CRC after colostomy.

Previous studies have demonstrated that the mental health of colostomy patients has a notable impact on their quality of life (Liao & Qin, 2014), response to stoma care (Raingruber, 2011), physical adaptation (Chaudhri, Brown, Hassan, & Horgan, 2005) and length of hospitalisation (Simmons, Smith, Bobb, & Liles, 2007). Emerging research indicates that various emotional reactions are important predictors of mental health outcomes (Whelton & Greenberg, 2005). It is common for patients to display one or more negative emotions when they are suffering from cancer or undergoing treatment (Kennifer et al., 2009). One prominent yet essentially overlooked health-related emotion is disgust.

Disgust has commonly been conceptualised as an emotional response to keep away from the external stimulus that may be offensive or unpleasant (Ekman, 1999; Gilbert, 2015), and its basic purpose is to motivate us to protect ourselves from disease (Curtis, Aunger, & Rabie, 2004). This emotion has been established through evolution as a way for creatures to protect themselves from consuming or coming into contact with dangerous substances (Chapman & Anderson, 2012; Rozin & Fallon, 1987). Generally, disgust elicitors are classified into seven domains: foods (e.g. contaminated food), animals, bodily products (e.g. waste), poor hygiene (e.g. body odour), sex, body envelope violations (e.g. deformity/disfigurement) and death (Rozin, Haidt, & McCauley, 2008). Qualitative studies have shown that colostomy patients often frequently report themes related to disgust (Powell, Azlan, Simpson, & Overton, 2016; Smith, Loewenstein, Rozin, Sherriff, & Ubel, 2007; Turner et al., 2008). Due to the particularity of the physiological structure and function of colostomy, as differentiated from the general trait disgust that is broad and heterogenous (Simpson, Carter, Anthony, & Overton, 2006), colostomy-specific disgust is featured with greater intensity and pertinence. Patients who have undergone colostomy surgeries, they lose regular bowel function, and as a consequence, their normal waste instead passes through the abdominal wall into a medical appliance known as a stoma. Fundamentally, a stoma involves closer contact with faecal matter than would normally occur during an individual's typical bowel movements. Apart from faeces, multiple disgust elicitors are associated with colostomy, including body fluids (e.g. blood), body envelope violations (e.g. colonoscopy insertion, surgical incision and wound appearance), hygiene (e.g. unpleasant odour) and death (Haidt, McCauley, & Rozin, 1994; Reynolds, Bissett, & Consedine, 2018; Reynolds, Consedine, & McCambridge, 2014). Given its evolutionary grounding as a vital element of the "behavioural immune system" (Schaller & Park, 2011), disgust is particularly relevant in facilitating psychological reactions to disease and its treatment (Reynolds, Consedine, Pizarro, & Bissett, 2013). Recent studies have shown that the unregulated disgust reaction is perceived as particularly threatening to colostomy patients. For instance, being more prone to disgust can predict increased stigma experiences, inadequate levels of adjustment and overall life satisfaction (Simpson et al., 2006), lack of help-seeking behaviour (Reynolds, McCambridge, Bissett, & Consedine, 2014) and social avoidance (Reynolds, Bissett, & Consedine, 2015).

Given that disgust is particularly relevant to mental health and considering the potential greater exposure to disgust-eliciting stimuli among colostomy patients, it is highly likely that the disgust experienced by an individual will be important for his or her mental health. Nevertheless, there has been a surprising oversight to date resulting in a lack of proper measurement tools for evaluating specific disgust among colostomy patients. As highlighted in a recent review by Reynolds et al. (2013), a comprehensive and thorough investigation of disgust may extend our understanding of the CRC trajectory and address the insufficient specialised tools to identify the potential disgusting stimuli (Chambers, O'Carroll, Brownlee, Libby, & Steele, 2016). In previous studies on disgust and CRC, the majority of researchers used the Disgust Scale-Revised (DS-R; Reynolds, Consedine, et al., 2014; Reynolds, McCambridge, et al., 2014). Due to the large number of items and dimensions, the DS-R-animal has been adopted as the operationalisation of trait disgust in CRC contexts, mainly due to the relatively similar elicitors as animal disgust, such as bodily products and death (Reynolds, Consedine, et al., 2014; Reynolds, McCambridge, et al., 2014). However, Olatunji et al. have pointed out that half of the items in DS-R are rated "True" or "False," and the term "Disgust" is not found on the items (Olatunji et al., 2007). Thus, it is difficult to confirm whether these items actually measure disgust sensitivity as differentiated from other forms of aversion. Moreover, there is no report on the validation of the DS-R among CRC patients. Smith et al. (2007) have developed two items to measure colostomy-specific disgust in order to distinguish it from general trait disgust. However, these efforts remain insufficient to accurately reflect the disgust specifically related to colostomy. Therefore, the present study sought to address this important gap in the current literature by establishing and validating a self-report Colostomy Disgust Scale (CDS) measurement for assessing disgust in colostomy patients.

2 | AIMS AND RESEARCH QUESTIONS

The purpose of this study was to establish and validate the psychometric properties of the Colostomy Disgust Scale (CDS) for assessing disgust in colostomy patients. We set out to examine the following questions:

1. What is the psychological construct of the CDS?
2. What are the items of the CDS?
3. Does the CDS have a good psychometric property which accurately and reliably measures colostomy-specific disgust?

3 | METHODS

As depicted in Figure 1, three distinct and sequential phases were undertaken: (a) item generation, (b) item selection and (c) initial evaluation and validation.

4 | RESEARCH DESIGN

The present research is a triphasic, cross-sectional psychometric study.

4.1 | Phase 1: Item generation

A pool of items was obtained from both a literature review and a focus group interview conducted with colostomy patients. Because of the lack of relevant literature, we broadened our search beyond

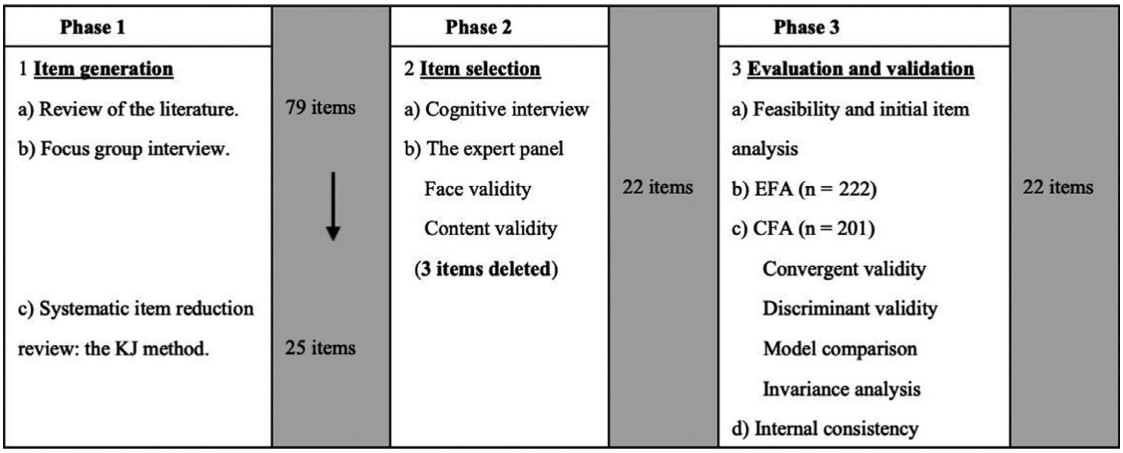

FIGURE 1 Phases of development of the Colostomy Disgust Scale

CRC to all cancers. The literature review was carried out through PubMed, Springer and Scopus using the following keywords: disgust, disgusting, unpleasant, revolting, psychology distress, cancer, carcinoma, tumour. Inclusion criteria were as follows: original and review studied using narrative, quantitative and/or qualitative methods; only English-language full-text articles published between 1990 and 2015. Exclusion criteria excluded studies that did not report essential data and additional information even after contact with the leading author. The purpose of the literature review was to ensure the absence of existing instruments on this topic and to establish a rationale for the study of disgust in colostomy. A focus group interview held with 12 colostomy patients recruited from a stoma clinic of a hospital in Tianjin was conducted with a focus on the perceptions of the colostomy (the detailed descriptive characteristics of the 12 patients are shown in Table 1). The purpose of the focus group interviews was to obtain detailed information about personal and group perceptions and opinions of the colostomy-specific disgust. The focus group was chaired by two researchers, one to facilitate the group discussion and the other to record responses, themes, enthusiasm, body language, mood of discussion and so forth. First, the participants were encouraged to speak freely, especially regarding the changes in their everyday lives after colostomy. Subsequently, the participants were asked to the following open-ended questions: How do you feel about your stoma? What is your degree of acceptance of your stoma? How are you experiencing the transition from normal to abnormal bowel function? What physical, social and psychological challenges have you faced during this period? The researchers kept the discussion focused on the topic under investigation and prepared to ask probing follow-up questions suggested by the participants' responses. The relevant ideas concerning their disgust towards colostomy were collected by means of interview notes. After completing the literature searches and focus group interview, a pool of 79 potential items was generated for the scale.

Then, the tentative scale was constructed based on a systematic item-reduction approach, the KJ method (Scupin, 1997), which involves four steps: (a) label making, (b) label grouping, (c) chart making and (d) explanation. In the label-making step, only information under observation relevant to the problem is written on note cards so that each note card contains a single item. In this step, our research team and patients reviewed the relevance and redundancy of items. Items were evaluated based on the relative importance of the content shown during the interview both in terms of the frequency with which the topic was discussed by participants and the significance attached to it. Content that was unclear (e.g. "I'm not sure if this feeling is caused by the colostomy"), vague (e.g. "Before the colostomy, I always hated being touched") or not eligible for consideration as disgust (e.g. "I am afraid of dermatitis") was excluded. Finally, we omitted items that were mentioned only once. Consensus decisions on whether an item was retained or not were made through discussion, and we, working with patients, integrated or deleted some items and wrote the information related to the colostomy-specific disgust one by one on the note card leading to the generation of 25 label cards. In the label-grouping step, note cards with similar content were put together and named. In this second step, the label cards were divided into seven themes associated with colostomy disgust: faeces, odour, poor hygiene, physical disability, appliance expenses, interpersonal communication and social function. In the chart-making step, the order of the placement of these groups was arranged according to content; the groups that seem to be closer in meaning to each other are placed closer, and vice versa. In this third step, we found that all seven themes were classified into two broader categories: the disgust related to stoma-related symptoms and the disgust related to interpersonal interactions. In the last step, the explanations of the findings obtained through these preceding steps were provided. After the discussion, researchers and patients reached a consensus that colostomy-specific disgust consists of two aspects,

TABLE 1 Demographic characteristics of the samples

Variable	Focus group interview and MJ method sample (*N* = 12)	EFA sample (*N* = 222)	CFA sample (*N* = 201)
Age (mean ± *SD*)	56.67 ± 6.84	61.31 ± 7.48	60.60 ± 7.45
Gender			
Male	8 (66.67)	129 (58.10)	122 (60.70)
Female	4 (33.33)	93 (41.90)	79 (39.30)
Education			
Primary or below	0 (0)	16 (7.20)	17 (8.50)
Junior high school	5 (41.70)	73 (32.90)	69 (34.30)
Senior high school	6 (50.0)	94 (42.30)	85 (42.30)
College and above	1 (8.30)	39 (17.60)	30 (14.90)
Marital status			
Single	0 (0)	6 (2.70)	5 (2.50)
Married	11 (91.70)	200 (90.10)	177 (88.10)
Divorced	1 (8.30)	5 (2.30)	9 (4.50)
Widowed	0 (0)	11 (4.9)	10 (4.90)
Occupational level			
Employed	9 (75.00)	43 (19.40)	34 (16.90)
Retired	3 (25.00)	161 (72.50)	152 (75.60)
Unemployed	0 (0)	18 (8.10)	15 (7.50)
Living status			
With others	8 (66.67)	213 (95.90)	192 (95.50)
Alone	4 (33.33)	9 (4.10)	9 (4.50)
Monthly income (yuan)			
<3,000	2 (16.67)	111 (50)	100 (49.70)
3,001-5,000	9 (75.00)	79 (35.60)	72 (35.80)
>5,000	1 (8.33)	32 (14.40)	29 (14.40)
Family history of CRC			
Yes	0 (0)	12 (5.40)	15 (7.50)
No	12 (100)	210 (94.60)	186 (92.50)
Complications of stoma			
Yes	9 (75)	113 (50.90)	99 (49.30)
No	3 (25)	109 (49.10)	102 (50.70)
Duration of stoma implantation			
<3 months	2 (16.67)	60 (27)	58 (28.90)
3 months to 1 year	8 (66.66)	126 (56.80)	117 (58.20)
>1 year	2 (16.67)	36 (16.20)	26 (12.90)
Stoma type			
Sigmoid colostomy	11 (91.67)	210 (94.60)	191 (95)
Descending colostomy	0 (0)	2 (0.90)	2 (1)
Ileum colostomy	1 (8.33)	10 (4.50)	8 (4)

namely the disgust related to stoma-related symptoms and the disgust related to interpersonal interactions.

As mentioned above, the first draft of a 25-item CDS was developed. Revilla et al. recommend a five-point response scale ("strongly disagree" to "strongly agree"). Such a scale enables the participants to accurately express their thoughts and opinions, as well as have a smoother of response selection experience (Revilla, Saris, & Krosnick, 2013). Therefore, all items of the CDS are set to be rated on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). The total score reflects the level of colostomy-specific disgust, with higher values indicating more disgust.

4.2 | Phase 2: Item selection

First, we conducted a cognitive interview with a new cohort of five colostomy patients to help test the potential scale items (Ferguson & Cox, 1993). Items were administered to participants, and they were asked to explain their understanding of each item and the corresponding response options, as described below. Eligibility criteria for participating in the cognitive testing of the preliminary survey included the following: Patients diagnosed with colorectal cancer, after colostomy, being able to communicate and willing to participate. The exclusion criterion was having a health or psychiatric condition that could impair participation in a half-hour interview. During the cognitive interview, patients were asked to read and complete the surveys and to paraphrase the thinking processes that they went through in answering the items, for example: What does that question mean to you, in your own words? What factors did you consider when you were deciding on your answer? Items were also discussed in terms of their acceptability, clarity, redundancy and importance. In this stage, the 5 colostomy patients reported that all items were simple and acceptable.

Then, a panel of 14 experts specialising in anorectal surgery and stoma clinic evaluated the face validity and content validity of the CDS. The assessment of face validity was performed with regard to grammar, item allocation, scaling and wording, while the content validity was assessed through a Content Validity Index (CVI). This index encompassed the item relevance ratings (1 = not relevant; 4 = highly relevant) by the expert panel (DeVellis, 2012; Polit, Beck, & Owen, 2007). The CVI was used to examine the content validity scores of each item (I-CVI) and its scale level (S-CVI; Davis, 1992; Grant & Davis, 1997). For a scale to be judged as having excellent content validity, it should contain only items with an I-CVI of ≥0.78 and have a S-CVI/Ave of ≥0.90 (Polit et al., 2007). The CDS were distributed to the experts by e-mail. After obtaining the evaluation results of the first round of the expert panel, the research team screened and modified the items according to the experts' opinions and then continued to the next round of expert panel evaluation of the revised CDS until the opinions of the experts reached a consensus. In this process, two rounds of the expert panel were conducted. Since the target population was expected to be fluent in Chinese, the instrument was constructed in Chinese. Six wording revisions were made after the experts evaluated the grammar and wording, and three items with CVI < 0.78 were removed, resulting in a 22-item pre-final version.

4.3 | Phase 3: Initial evaluation and validation

To test the psychometric properties of the CDS in a wider setting, a cross-sectional study design was carried out to refine item composition and examine the validity and reliability of the final draft of the 22-item CDS developed in the procedure described above.

4.4 | Population and procedure

This study was conducted in a comprehensive tertiary hospital in China. The hospital has 1,800 beds and 5 anus-intestines departments and is the largest anorectal disease diagnosis centre in North China.

The sample size was assessed according to the number of items in the CDS, which was multiplied by 5–10 as suggested by Polit and Yang (2016). In the evaluation and validation phase, exploratory factor analysis (EFA) was applied to identify the main factors of the CDS. The preferred maximum sample size required for EFA was thus determined to be 220 patients. Confirmatory factor analysis (CFA) was applied to assess the coherence between the data and the structure. In this case, CFA was used to test the generality of the extracted factor from a separate sample of patients, for which we recruited a separate sample of 201 patients.

From January 2015 to April 2016, two separate samples (N_1 = 222; N_2 = 201) were recruited from the colostomy patients who presented to the stoma clinic for regular check-up in a tertiary hospital in Tianjin. Eligibility criteria were (a) a confirmed diagnosis of colorectal cancer, had undergone colostomy treatment at least 1 month before enrolment and regular stoma clinic attendance during the period of research; (b) at least 18 years of age; (c) be able to speak, read and write Chinese; and (d) voluntary participation. Those patients with a history of mental health problems, metastatic cancer and/or other severe physical disorders, such as heart attack and stroke, were excluded.

4.5 | Ethical considerations

Ethical approval was obtained from the ethics committee of Tianjin People's Hospital. Both verbal and written information about this research, such as the voluntary nature of participation, the degree of involvement needed and the freedom to withdraw from participation at any time, were given to each participant. Written informed consent was obtained from all participants, and assurances of confidentiality were provided.

4.6 | Data collection procedure

The research team consisted of a doctoral student as the leader and five master's degree students as research assistants, all of whom have been systematically trained in the following two aspects: familiarisation with research content and research methods and precautions during the data collection procedure, such as the unified use of guidance words and checking for missing values in the questionnaire. The patients completed the study questionnaires while undergoing routine check-ups during stoma clinic visits in the ward. The questionnaire survey and data collection were completed by the five research assistants. Once written consent was secured, questionnaires were distributed to the patients. After the patients completed the questionnaire, answers

were immediately checked by the research assistants to ensure that the questionnaires were completely filled out. If missing values were found, the questionnaire was returned to the patient so that he or she could fill in the missing items. Generally, patients completed the questionnaires in 5–8 min, and a small gift was provided as a reward.

4.7 | Data analysis

Data from the surveys were entered into the IBM SPSS Statistics version 20.0, R psych package and the IBM SPSS Amos version 22.0 for data management and statistical analysis. The psychometric properties of the CDS were evaluated using the following statistical approaches.

4.8 | Feasibility and initial item analysis

Feasibility included the CDS response rate, respondent's tome for filling out the CDS and data completeness on the items of the questionnaire.

Completeness was evaluated by the percentage of missing data, with 15% set as "acceptable" (Dong & Peng, 2013). Initial item analysis was assessed based on three aspects, and the item was removed if (a) floor and ceiling effect (>0.30; Kane, 2006), (b) corrected item-total correlations (<0.30; Tabachnick & Fidell, 2013), and (c) increased alpha occurred upon item removal.

4.9 | Exploratory factor analysis

The predominant factors of CDS were identified through exploratory EFA (Grant & Davis, 1997; McCoach, Gable, & Madura, 2013). A total of 222 patients with colostomy were recruited to ensure a sufficient sample size. The R psych package was used to measure the polychoric correlation among the 22 items of the CDS. The matrix of these correlations was used in the subsequent EFA. Principal axis factoring (PAF) with oblique rotation was performed to extract the predominant factors, as previous reports have suggested a positive association among the functional domains of disgust (Olatunji, Haidt, McKay, & David, 2008; Olatunji et al., 2007). Both the Kaiser–Meyer–Olkin (KMO) and Bartlett's tests were used to assess sampling adequacy for EFA (Ferguson & Cox, 1993). All factors with eigenvalues >1.00 were selected for subsequent factor isolation. The scree plot was used to determine the number of factors for plotting. The significance level of factor loading was set at ≥0.40 (Norris & Lecavalier, 2010).

4.10 | Confirmatory factor analysis

The proposed two-factor solution of the CDS was evaluated by CFA for the goodness-of-fit estimation on the actual data. A separate sample of 201 patients with colostomy was recruited. The assessment of model fit was carried out with chi-squared values, root mean square error of approximation (RMSEA) <0.06, comparative fit index (CFI), goodness-of -fit index (GFI), normed fit index (NFI) and Tucker–Lewis index (TLI) ≥0.95 (Harrington, 2009). In CFA, the convergent validity of the CDS was verified through the factor loading of each item (≥0.50; Gorsuch, 1997), composite reliability (CR) value (≥0.70) and the average variance extracted (AVE) of the two factors (≥0.50; Woo, 2012). Then, the discriminant validity of the CDS was examined by conducting a one-factor model and a bi-factor model to compare with the proposed model (i.e. a two-factor model). Furthermore, to establish whether the two-factor model is stable and can be replicated across different groups, measurement invariance was further evaluated using multiple-group CFA. The significance test of the change in chi-square for two nested models was evaluated as a criterion for measurement invariance. If the chi-square is not significant, it is determined that factor loadings are equivalent and thus evidence of weak metric invariance and scalar invariance (Brown, 2006). In our study, the colostomy patients were categorised according to their gender, in order to examine the possible existence of gender invariance.

4.11 | Internal consistency

To verify the internal consistency of the CDS, Cronbach's alpha coefficient of the subscales was calculated, with an acceptable value of 0.70 (Cronbach, 1951).

5 | RESULTS

5.1 | Participants

As mentioned above, a total of 222 colostomy patients were involved in the EFA, with a mean age of 61.31 ($SD = 7.48$). The majority of the participants (58.10%, $n = 129$) were men. Table 1 summarises the descriptive characteristics of participants in both EFA and CFA.

5.2 | Feasibility and initial item analysis

The gross response rate for the CDS was 100%, with no missing value, and the vast majority of the responses fell within the score range of 2 to 4. Overall, the average time for filling out the questionnaire was 7.8 min ($SD = 5.1$). All items exhibited no floor and ceiling effect (<0.30), the corrected item-total correlation value was >0.30, and the alpha value did not increase if any item was deleted (Table 2).

5.3 | EFA

The underlying factor structure of the 22-item scale was assessed by PAF. The KMO measure was 0.946, and Bartlett's test result was

TABLE 2 22-Item of Colostomy Disgust Scale ($N = 222$)

Item	Factor	Floor effect	Ceiling effect	Corrected item-total correlation	Cronbach's alpha if item deleted	Factor loadings		Eigenvalue	Variance
						Factor 1	Factor 2		
Item 1	Factor 1	0	0.02	0.71	0.94	0.69	0.02	7.55	34.32%
Item 2		0.02	0	0.71	0.93	0.65	0.06		
Item 3		0.01	0.02	0.75	0.93	0.67	0.06		
Item 4		0.01	0.01	0.73	0.93	0.67	0.06		
Item 5		0.04	0.01	0.73	0.93	0.73	0.07		
Item 6		0.03	0.01	0.73	0.93	0.70	−0.04		
Item 7		0.02	0.01	0.70	0.94	0.70	−0.01		
Item 8		0.05	0.05	0.74	0.93	0.78	−0.01		
Item 9		0	0.04	0.73	0.93	0.70	0.01		
Item 10		0.02	0.02	0.69	0.94	0.75	−0.09		
Item 11		0.03	0.04	0.72	0.93	0.75	−0.10		
Item 12		0.03	0.01	0.73	0.93	0.75	0.01		
Item 13		0.06	0	0.63	0.94	0.72	−0.02		
Item 14	Factor 2	0	0.04	0.68	0.91	−0.06	0.76	3.99	18.13%
Item 15		0.03	0.01	0.71	0.90	−0.07	0.75		
Item 16		0.03	0.05	0.70	0.90	0.08	0.73		
Item 17		0.01	0.02	0.70	0.90	0.05	0.73		
Item 18		0.01	0	0.68	0.91	0.03	0.70		
Item 19		0.02	0.05	0.68	0.91	0.03	0.75		
Item 20		0.03	0.04	0.71	0.90	−0.04	0.81		
Item 21		0.01	0	0.76	0.90	0.08	0.67		
Item 22		0	0.05	0.70	0.90	−0.07	0.72		

significant ($\chi^2 = 2{,}182.974$, $p < .001$), demonstrating the adequacy of the sample for EFA. Through oblique rotation, a two-factor solution was extracted (with eigenvalues > 1), and the two factors accounted for a total of 52.47% of the explained variance, with factor loadings of ≥0.40 for all items on their respective factors. Factor 1 was described as "core disgust" which accounted for 34.32% of the total variance and had an eigenvalue of 7.55. This factor was composed of 13 items with factor loadings ranging from 0.65 to 0.78. Factor 2 was described as "interpersonal disgust," which accounted for 18.15% of the total variance and had an eigenvalue of 3.99. This factor had 9 items with factor loadings ranging from 0.67 to 0.81. The above results indicate that the factor loadings of the CDS are considered to be good. The items and loadings are shown in Table 2.

5.4 | CFA

Figure 2 shows the CFA results of the factor structure and model fit of CDS. Final fit statistics were all acceptable as follows: chi-square ($\chi^2 = 226.284$, $df = 208$, $p < .001$), CFI = 0.99, TLI = 0.99 and RMSEA = 0.02.

The convergent validity of the CDS was examined by CFA as well as AVE and CR. The results showed that the factor loadings of all items ranged from 0.65 to 0.81, the AVE values were 0.55 and 0.54, and the CR values were 0.94 and 0.92. As described earlier, all of the criteria displayed good acceptability, supporting that the proposed CDS has satisfactory discriminant validity (Table 3).

In addition, a one-factor model and a bi-factor model were compared with the two-factor model. Table 4 presents the fit indexes for model comparison. To our expectation, the results demonstrated that the chi-square difference test between the one-factor model and the two-factor model was significant (728.64, $\Delta df = 1$, $p < .001$), and the chi-square difference test between bi-factor model and two-factor model was significant (36.28, $\Delta df = 21$, $p < .05$), which indicated that the two-factor model had a significantly better fit than the one-factor model and the bi-factor model.

Additionally, we conducted a multiple-group analysis to examine the measurement invariance across genders among colostomy patients (men, $n = 122$; women, $n = 79$). As shown in Table 5, all measurement invariance models exhibited a moderate fit to the data, and the final invariance model represents a scalar invariance model across genders among colostomy patients. This result indicates the

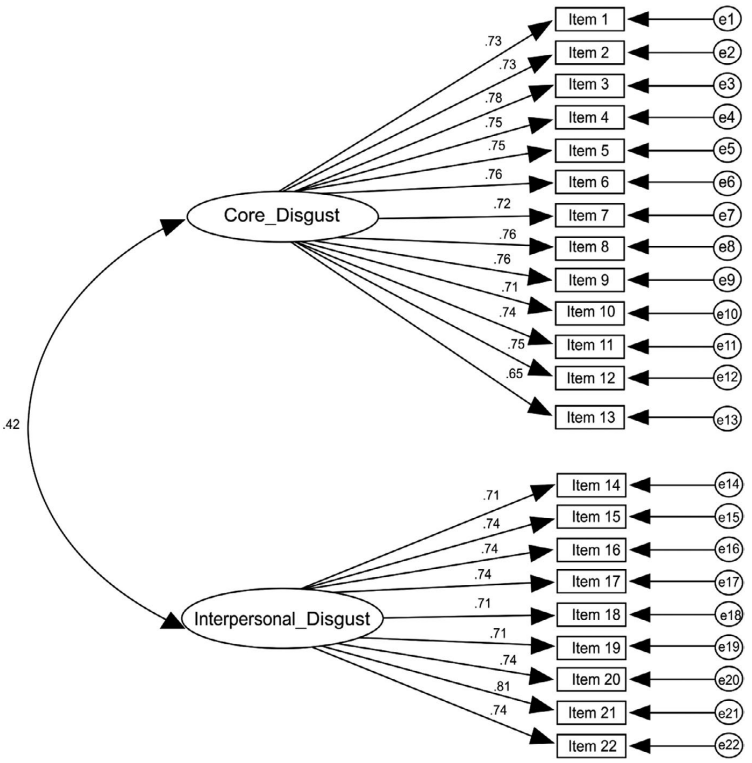

FIGURE 2 Factor structure of the refined model of the Colostomy Disgust Scale

acceptable psychometric properties of the CDS for assessing the measurement invariance.

5.5 | Internal consistency

To determine internal consistency, Cronbach's alpha values were calculated individually for the subscales of the CDS. Cronbach's alpha values of the core disgust and interpersonal disgust were 0.94 and 0.91, respectively, indicating that the proposed CDS has good internal consistency (Table 6).

6 | DISCUSSION

In this work, the CDS was established and validated for assessing colostomy-specific disgust. After reviewing previous literature on the disgust in colostomy, we noted that no standardised tool has been specifically designed to identify the triggers of disgust in CRC contexts, as well as in colostomy. Thus, we constructed a simple and easy-to-use 22-item scale to examine colostomy-specific disgust.

The newly established and validated scale was developed in Chinese, and the target population was colostomy patients. This instrument demonstrated good feasibility, as it required approximately 5 min to complete, suggesting its low response burden. Assessment of the reliability and validity revealed acceptable outcomes that confirmed that the CDS has good psychometric properties. As shown in results, all items had no floor and ceiling effect and exhibited acceptable item-total correlations in reliability analysis. Moreover, the alpha values for the two subscales were above 0.90, indicating good internal consistency. The majority of the patients recruited in our study were those who had undergone the operation within one year, and the scores they obtained on the two subscales indicated that the disgust of this population was at a moderate level, which was consistent with previous findings that patients are prone to negative psychology and adjustment difficulties within one year after colostomy (Ang, Chen, Siah, He, & Klainin-Yobas, 2013; Krouse et al., 2009). Our results indicated that the CDS had the ability to keenly capture the colostomy-specific disgust in colostomy patients.

The computed PAF followed by CFA indicated a two-factor solution corresponding to the two subscales: core disgust and interpersonal disgust. These factors were relatively consistent with those constructed from previous findings (Olatunji, Sawchuk, de Jong, & Lohr, 2006; Olatunji, Williams, Lohr, & Sawchuk, 2005; Rozin et al., 2008), supporting a high content validity of the newly developed measures. The results of convergent validity and discriminant validity tests also confirmed that the construct validity of the CDS is good. To further identify the factorial structure of the CDS, we examined the factor structure by conducting

TABLE 3 Factor structures by confirmatory factor analysis ($N = 201$)

Items	Factor	Standardised estimate	*p*	CR	AVE
1. The stoma on my body makes me feel sick.	Core disgust	0.73	<.001	0.94	0.55
2. I admit that the stoma has caused me a lot of trouble.		0.73	<.001		
3. I am tired of my stoma, as it makes me feel my body is incomplete.		0.78	<.001		
4. The decision to make a stoma makes me feel some degree of regret.		0.75	<.001		
5. I still can't stand the fact that there is a stoma on my body.		0.75	<.001		
6. This stoma makes me feel that I am no longer a normal person.		0.76	<.001		
7. I try to avoid looking at the stoma.		0.72	<.001		
8. When I change my stoma bag, the faeces I encounter makes me feel disgusted.		0.76	<.001		
9. Compared with my normal anus, the stoma bag needs frequent replacement and cleaning, which makes me upset.		0.76	<.001		
10. The smell of faeces emanating from the stoma of the intestine disgusts me.		0.71	<.001		
11. The cost of the stoma bag annoys me.		0.74	<.001		
12. When I see my faeces being excreted from time to time and I can't control it, I feel irritable.		0.75	<.001		
13. I am afraid to eat or deliberately eat less food to avoid faecal discharge.		0.65	<.001		
14. I think people will feel uncomfortable once they know about my stoma.	Interpersonal disgust	0.71	<.001	0.92	0.54
15. I think I will not be affirmed by others as before because of my stoma.		0.74	<.001		
16. My stoma makes me ashamed in front of strangers.		0.74	<.001		
17. My stoma makes me embarrassed at a friend's party.		0.74	<.001		
18. I avoid going out to dinner because of the stoma.		0.71	<.001		
19. When others mention the topic of the stoma, I have some concerns.		0.71	<.001		
20. I will feel humiliated if people around me smell the faeces from the stoma.		0.74	<.001		
21. I am afraid that others will know about my stoma.		0.81	<.001		
22. I think others will dislike me because of this stoma.		0.74	<.001		

Abbreviations: AVE, average variance; CR, composite reliability.

a one-factor model and a bi-factor model to compare with the two-factor model. The results showed that the two-factor structural model of the CDS is convincing and worthy of promotion. Finally, we evaluated the extent to which the two-factor structure can be replicated across gender among colostomy patients and found that the structure is highly stable. These results provided important additional information on the broad potential utility of the CDS for patients with colostomy.

With regard to the two factors of the CDS, core disgust is interpreted as an internal cause of disgust mainly towards the physiological changes triggered by disease, while interpersonal disgust is an external cause of disgust that is perceived from the outside due to the profound physical changes. Notably, these two factors were found to be moderately correlated with each other in our study. This finding implies that the two trait facets of colostomy-specific disgust are partially independent and thus may be differentially related to other trait factors and to certain psychological stress responses.

The elicitors of core disgust are recognised as the most salient and common disgust-provoking objects to date (Rozin et al., 2008). Core disgust has been accurately considered as deriving from stimuli containing a likelihood of pathogen transmission. Poor hygiene, bodily excretions (e.g. faeces and blood), damage to the bodily envelope (e.g. wounds and deformities) and death have all been reported as the main sources of this response (Berle & Phillips, 2006). Therefore, being a “diseased” or “contaminating” object (Neal et al.,

TABLE 4 Model comparison for confirmatory factor analysis ($N = 201$)

Model	χ^2	*df*	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf	*p*
Two-factor model	226.284	208	0.993	0.992	0.021			
One-factor model	954.921	209	0.688	0.666	0.133	728.640	1	<.001
Bi-factor model	190.003	187	0.923	0.923	0.031	36.281	21	.020

TABLE 5 Model fit of various invariance models ($N = 201$)

Model	χ^2	*df*	CFI	TLI	RMSEA	$\Delta\chi^2$	Δdf	*p*
1. Configural invariance	428.915	416	0.995	0.994	0.018			
2. Metric invariance	454.000	436	0.993	0.992	0.020	25.085	20	.198
3. Scalar invariance	479.935	456	0.990	0.990	0.023	51.020	40	.114

TABLE 6 Factor score, correlation and Cronbach's α of the Colostomy Disgust Scale ($N = 201$)

Variable	*M* (*SD*) Range	Core disgust *r*(*p*)	Interpersonal disgust *r*(*p*)	Cronbach's α
Core disgust	39.79 (7.99) (18–61)	1		0.94
Interpersonal disgust	29.32(5.68) (16–46)	0.39**	1	0.91

*$p < .05$;
**$p < .01$;
***$p < .001$.

2007), sickness and nausea (Carey & Burish, 1988), bowel issues (Bauer, Bastian, Gozzi, & Stief, 2009), physical alterations resulted from surgery (Bredin, 1999), negative smells and the awareness of their own mortality and death (Goldenberg, Arndt, Hart, & Routledge, 2008) are all stimuli that elicit colostomy-specific disgust that colostomy patients must tackle. As opposed to core disgust, interpersonal disgust is generally experienced as disgust and avoidance from outside. In other words, individuals with this type of disgust often consider themselves a repulsive person (Powell, Overton, & Simpson, 2014). Fundamentally, disgust has an intimate link with one's bodily dissatisfaction and appearance concerns (Griffiths & Page, 2008; Park, Schaller, & Crandall, 2007). The profound physical changes engendered by colostomy may result in disgust reactions with a stronger influence on social function, particularly through the increased perceived discrimination and worsening of social isolation (Griffiths & Page, 2008).

In view of the comments on the DS-R by Olatunji et al. (2007), a 5-point Likert-type scale (1 = strongly disagree; 5 = strongly agree) was adopted, which can maximise the variability within the answers and measure colostomy-specific disgust in colostomy patients. Furthermore, multiple emotions phrasing was rated in the CDS, such as humiliate and dislike (Olatunji et al., 2007). More importantly, the CDS was developed and tested in patients with colostomy, which could produce more accurate results for the measurement of colostomy-specific disgust. Even though the current findings offer numerous benefits, several limitations should be overcome to provide future research avenues. First, more attention should be paid to the newly developed criteria for good content validity of a patient-reported outcome measure. Content validity is formed of item relevance, appropriateness of response options and recall period, comprehensiveness and comprehensibility (Terwee et al., 2018). In our study, we integrated or deleted some items in the phase of item generation, which may raise concerns about the comprehensiveness of the scale. Moreover, we tested only comprehensibility and item relevance, which only reflects a certain degree of content validity. To enhance this approach, we suggest that a fuller investigation of content validity is warranted. Second, in terms of the validation method, we did not perform concurrent reliability and test–retest reliability testing. Hence, future investigation should include comparisons of the existing disgust measures to provide additional evidence for the construct validity of the CDS.

Given the particular nature of colostomy, colostomy-specific disgust features greater intensity and pertinence than general trait disgust, and its close relationship with health (e.g. disgust predicts greater stigma, lower adjustment and poorer life satisfaction) plays an important role in the colostomy context. The newly established and validated scale can be used to evaluate colostomy-specific disgust experienced by patients with colostomy. In addition, this CDS can be valuable for the identification of colostomy patients with a high level of disgust, thereby facilitating medical care personnel to take corresponding measures, including psychological counselling and emotive therapy. The findings of this study also have potential use in future research and practice. For instance, the proposed CDS may be used to inform the evaluation of novel therapies and to help drive the development of ameliorative interventions for enhancement of the quality of life among colostomy patients.

7 | CONCLUSION

We developed a 22-item self-reported questionnaire, the CDS, to assess colostomy-specific disgust experienced by patients with colostomy. This initial evaluation shows that the CDS has a robust psychometric profile, suggesting that the scale is worthy of promotion and use in clinical settings. Continued examination of the scale, including psychometric testing on large samples, content validity, test–retest reliability and the MIC (minimal important change) value, represents important avenues for future work.

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CONFLICT OF INTEREST

There are no conflicts of interest on the part of any named author.

AUTHOR CONTRIBUTIONS

Y.J. and M.J. were involved in the study's conception and design. H.M., Y.L. and Y.Z. were involved in data collection and analysis. Y.J. drafted the manuscript.

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REFERENCES

Ang, S. G., Chen, H. C., Siah, R. J., He, H. G., & Klainin-Yobas, P. (2013). Stressors relating to patient psychological health following stoma. Surgery: An integrated literature review. *Oncology Nursing Forum*, *40*(6), 587–594. https://doi.org/10.1188/13.ONF.587-594

Arnold, M., Sierra, M. S., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2017). Global patterns and trends in colorectal cancer incidence and mortality. *Gut*, *66*(4), 683–691. https://doi.org/10.1136/gutjnl-2015-310912

Bauer, R. M., Bastian, P. J., Gozzi, C., & Stief, C. G. (2009). Postprostatectomy incontinence: All about diagnosis and management. *European Urology*, *55*(2), 322–333. https://doi.org/10.1016/j.eururo.2008.10.029

Berle, D., & Phillips, E. S. (2006). Disgust and obsessive-compulsive disorder: An update. *Psychiatry: Interpersonal and Biological Processes*, *69*(3), 228–238. https://doi.org/10.1521/psyc.2006.69.3.228

Bredin, M. (1999). Mastectomy, body image and therapeutic massage: A qualitative. Study of women's experience. *Journal of Advanced Nursing*, *29*(5), 1113–1120. https://doi.org/10.1046/j.1365-2648.1999.00989.x

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: The Guilford Press.

Carey, M. P., & Burish, T. G. (1988). Etiology and treatment of the psychological side effects associated with cancer chemotherapy: A critical review and discussion. *Psychological Bulletin*, *104*(3), 307–325. https://doi.org/10.1037/0033-2909.104.3.307

Chambers, J., O'Carroll, R. E., Brownlee, L. A., Libby, G., & Steele, R. (2016). Colorectal cancer screening and perceived disdust: The importance of the ick factor in faecal occult blood test uptake. *Colorectal Cancer: Open Access*, *2*(1), 1–8. https://doi.org/10.21767/2471-9943.100013

Chapman, H. A., & Anderson, A. K. (2012). Understanding disgust. *Annals of the New York Academy of Sciences*, *1251*(1), 62–76. https://doi.org/10.1111/j.17496632.2011.06369.x

Chaudhri, S., Brown, L., Hassan, I., & Horgan, A. F. (2005). Preoperative intensive, community-based vs. traditional stoma education: A randomized, controlled trial. *Diseases of the Colon & Rectum*, *48*(3), 504–509. https://doi.org/10.1007/s10350-004-0897-0

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297–334. https://doi.org/10.1007/BF02310555

Curtis, V., Aunger, R., & Rabie, T. (2004). Evidence that disgust evolved to protect from risk of disease. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, *271*(suppl_4), S131–S133. https://doi.org/10.1098/rsbl.2003.0144

Davis, L. L. (1992). Instrument review: Getting the most from a panel of experts. *Applied Nursing Research*, *5*(4), 194–197. https://doi.org/10.1016/S0897-1897(05)80008-4

DeVellis, R. F. (2012). *Scale development: Theory and applications*. Thousand Oaks, CA: Sage.

Dong, Y., & Peng, C. Y. (2013). Principled missing data methods for researchers. *SpringerPlus*, *2*(1), 222. https://doi.org/10.1186/2193-1801-2-222

Ekman, P. (1999). Basic emotions. In T. Dalgleish & M. J. Power (Eds.), *Handbook of cognition and emotion* (pp. 45–60). New York, NY: Wiley.

Ferguson, E., & Cox, T. (1993). Exploratory factor analysis: A users' guide. *International Journal of Selection and Assessment*, *1*(2), 84–94. https://doi.org/10.1111/j.14682389.1993.tb00092.x

Ferlay, J., Shin, H. R., Bray, F., Forman, D., Mathers, C., & Parkin, D. M. (2008). *v1.2, Cancer incidence and mortality worldwide: IARC CancerBase No. 10, 2010*. Retrieved from http://globocan.iarc.fr

Gilbert, P. (2015). Self-disgust, self-hatred and compassion focused therapy. In P. A. Powell, P. G. Overton, & J. Simpson (Eds.), *The revolting self: Perspectives on the psychological, social, and clinical implications of self-directed disgust*. London, UK: Karnac Books.

Goldenberg, J. L., Arndt, J., Hart, J., & Routledge, C. (2008). Uncovering an existential barrier to breast self-exam behavior. *Journal of Experimental Social Psychology*, *44*(2), 260–274. https://doi.org/10.1016/j.jesp.2007.05.002

Gorsuch, R. L. (1997). Exploratory factor analysis: Its role in item analysis. *Journal of Personality Assessment*, *68*(3), 532–560. https://doi.org/10.1207/s15327752jpa6803_5

Grant, J. S., & Davis, L. L. (1997). Selection and use of content experts for instrument development. *Research in Nursing & Health*, *20*(3), 269–274. https://doi.org/10.1002/(SICI)1098-240X(199706)20:3<269:AID-NUR9>3.0.CO;2-G

Griffiths, L. J., & Page, A. S. (2008). The impact of weight-related victimization on peer relationships: The female adolescent perspective. *Obesity*, *16*(S2), S39–S45. https://doi.org/10.1038/oby.2008.449

Haidt, J., McCauley, C., & Rozin, P. (1994). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality and Individual Differences*, *16*(5), 701–713. https://doi.org/10.1016/01918869(94)90212-7

Harrington, D. (2009). *Confirmatory factor analysis*. New York: Oxford University Press.

Kane, R. L. (2006). *Understanding health care outcomes research*. Boston, MA: Jones and Bartlett Publishers.

Kennifer, S. L., Alexander, S. C., Pollak, K. I., Jeffreys, A. S., Olsen, M. K., Rodriguez, K. L., … Tulsky, J. A. (2009). Negative emotions in cancer care: Do oncologists' responses depend on severity and type of emotion? *Patient Education and Counseling*, *76*(1), 51–56. https://doi.org/10.1016/j.pec.2008.10.003

Krouse, R. S., Grant, M., Rawl, S. M., Mohler, M. J., Baldwin, C. M., Coons, S. J., … Ko, C. Y. (2009). Coping and acceptance: The greatest challenge for veterans with intestinal stomas. *Journal of*

Psychosomatic Research, *66*, 227–233. https://doi.org/10.1016/j.jpsychores.2008.09.009

Liao, C., & Qin, Y. (2014). Factors associated with stoma quality of life among stoma patients. *International Journal of Nursing Sciences*, *1*(2), 196–201. https://doi.org/10.1016/j.ijnss.2014.05.007

Ma desen. (2006). *Stoma therapy and rehabilitation theory and practice* (p. 117). Beijing: The Medicine Science and Technology Press of China.

McCoach, D. B., Gable, R. K., & Madura, J. P. (2013). *Instrument development in the affective domain*. New York: Springer. https://doi.org/10.1007/978-1-4614-7135-6

Neal, C., Beckjord, E. B., Rechis, R., Schaeffer, J., Berno, D., & Duchover, Y. (2007). *Cancer stigma and silence around the world: A LIVESTRONG report*. Texas: LIVESTRONG Foundation, Austin.

Norris, M., & Lecavalier, L. (2010). Evaluating the use of exploratory factor analysis in developmental disability psychological research. *Journal of Autism and Developmental Disorders*, *40*(1), 8–20. https://doi.org/10.1007/s10803-0090816-2

Olatunji, B. O., Haidt, J., McKay, D., & David, B. (2008). Core, animal reminder, and con tamination disgust: Three kinds of disgust with distinct. Personality, behavioral, physiological, and clinical correlates. *Journal of Research in Personality*, *42*(5), 1243–1259. https://doi.org/10.1016/j.jrp.2008.03.009

Olatunji, B. O., Sawchuk, C. N., de Jong, P. J., & Lohr, J. M. (2006). The structural relation between disgust sensitivity and blood–injection–injury fears: A cross-cultural comparison of US and Dutch data. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*(1), 16–29. https://doi.org/10.1016/j.jbtep.2005.09.002

Olatunji, B. O., Williams, N. L., Lohr, J. M., & Sawchuk, C. N. (2005). The structure of disgust: Domain specificity in relation to contamination ideation and excessive washing. *Behaviour Research and Therapy*, *43*(8), 1069–1086. https://doi.org/10.1016/j.brat.2004.08.002

Olatunji, B. O., Williams, N. L., Tolin, D. F., Abramowitz, J. S., Sawchuk, C. N., Lohr, J. M., & Elwood, L. S. (2007). The disgust scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment*, *19*(3), 281–297. https://doi.org/10.1037/1040-3590.19.3.281

Park, J. H., Schaller, M., & Crandall, C. S. (2007). Pathogen-avoidance mechanisms and the stigmatization of obese people. *Evolution and Human Behavior*, *28*(6), 410–414. https://doi.org/10.1016/j.evolhumbehav.2007.05.008

Polit, D. F., Beck, C. T., & Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, *30*(4), 459–467. https://doi.org/10.1002/nur.20199

Polit, D. F., & Yang, F. M. (2016). *Measurement and the measurement of change: A primer for health professionals*. Philadelphia: Lippincott Williams & Wilkins.

Powell, P. A., Azlan, H. A., Simpson, J., & Overton, P. G. (2016). The effect of disgust related side-effects on symptoms of depression and anxiety in people treated for cancer: A moderated mediation model. *Journal of Behavioral Medicine*, *39*(4), 560–573. https://doi.org/10.1007/s10865-016-9731-0

Powell, P. A., Overton, P. G., & Simpson, J. (2014). The revolting self: An interpretative phenomenological analysis of the experience of self-disgust in females with depressive symptoms. *Journal of Clinical Psychology*, *70*(6), 562–578. https://doi.org/10.1002/jclp.22049

Raingruber, B. (2011). The effectiveness of psychosocial interventions with cancer patients: An integrative review of the literature (2006–2011). *ISRN Nursing*, *2011*, 1–27. https://doi.org/10.5402/2011/638218

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2013). Choosing the number of categories in agree-disagree scales. *Sociological Methods & Research*, *43*(1), 73–97. https://doi.org/10.1177/0049124113509605

Reynolds, L. M., Bissett, I. P., & Consedine, N. S. (2015). Predicting the patients who will struggle with anal incontinence: Sensitivity to disgust matters. *Colorectal Disease*, *17*(1), 73–80. https://doi.org/10.1111/codi.12781

Reynolds, L. M., Bissett, I. P., & Consedine, N. S. (2018). Emotional predictors of bowel screening: The avoidance-promoting role of fear, embarrassment, and disgust. *BMC Cancer*, *18*(1), 518. https://doi.org/10.1186/s12885-0184423-5

Reynolds, L. M., Consedine, N. S., & McCambridge, S. A. (2014). Mindfulness and disgust in colorectal cancer scenarios: non-judging and non-reacting components predict avoidance when it makes sense. *Mindfulness*, *5*(4), 442–452. https://doi.org/10.1007/s12671-0130200-3

Reynolds, L. M., Consedine, N. S., Pizarro, D. A., & Bissett, I. P. (2013). Disgust and behavioral avoidance in colorectal cancer screening and treatment: a systematic review and research agenda. *Cancer Nursing*, *36*(2), 122–130. https://doi.org/10.1097/NCC.0b013e31826a4b1b

Reynolds, L. M., McCambridge, S. A., Bissett, I. P., & Consedine, N. S. (2014). Trait and state disgust: An experimental investigation of disgust and avoidance in colorectal cancer decision scenarios. *Health Psychology*, *33*(12), 1495–1506. https://doi.org/10.1037/hea0000023

Rozin, P., & Fallon, A. E. (1987). A perspective on disgust. *Psychological Review*, *94*(1), 23–41. https://doi.org/10.1037/0033-295X.94.1.23

Rozin, P., Haidt, J., & McCauley, C. R. (2008). Disgust. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 757–776). New York: Guilford Press.

Schaller, M., & Park, J. H. (2011). The behavioral immune system (and why it matters). *Current Directions in Psychological Science*, *20*(2), 99–103. https://doi.org/10.1177/0963721411402596

Scupin, R. (1997). The KJ method: A technique for analyzing data derived from Japanese ethnology. *Human Organization*, *56*(2), 233–237. https://doi.org/10.17730/humo.56.2.x335923511444655

Simmons, K. L., Smith, J. A., Bobb, K.-A., & Liles, L. L. M. (2007). Adjustment to colostomy: Stoma acceptance, stoma care self-efficacy and interpersonal relationships. *Journal of Advanced Nursing*, *60*(6), 627–635. https://doi.org/10.1111/j.1365-2648.2007.04446.x

Simpson, J., Carter, S., Anthony, S. H., & Overton, P. G. (2006). Is disgust a homogeneous emotion? *Motivation and Emotion*, *30*(1), 31–41. https://doi.org/10.1007/s11031-006-9005-1

Smith, D. M., Loewenstein, G., Rozin, P., Sherriff, R. L., & Ubel, P. A. (2007). Sensitivity to disgust, stigma, and adjustment to life with a colostomy. *Journal of Research in Personality*, *41*(4), 787–803. https://doi.org/10.1016/j.jrp.2006.09.006

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. Boston, MA: Pearson.

Terwee, C. B., Prinsen, C. A. C., Chiarotto, A., Westerman, M. J., Patrick, D. L., Alonso, J., … Mokkink, L. B. (2018). COSMIN methodology for evaluating the content validity of patient-reported outcome measures: A Delphi study. *Quality of Life Research*, *27*(5), 1159–1170. https://doi.org/10.1007/s11136-018-1829-0

Turner, M. C., O'Brien, J. D., Kahn, R. M., Mantyh, C. R., Migaly, J., & Ariely, D. (2008). Impact of disgust on intentions to undergo colorectal. *Surgery. Diseases of the Colon & Rectum*, *61*(12), 1386–1392. https://doi.org/10.1097/DCR.0000000000001254

Whelton, W. J., & Greenberg, L. S. (2005). Emotion in self-criticism. *Personality and Individual Differences*, *38*(7), 1583–1595. https://doi.org/10.1016/j.paid.2004.09.024

Woo, J. P. (2012). *The concept and understanding of structural equation*. Korea: Hannarae.

World Cancer Research Fund International. (2012). *Cancer facts and figures*. Retrieved from http://www.wcrf.org/int/cancer-facts-figures/worldwide-data

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