

Body image in head and neck cancer patients - Schilder's conceptual framework revisited

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ABSTRACT

Background

Disfigurement and dysfunction of the face are attributes of body image disturbance in individuals with head and neck cancer. Research in body image has highlighted that people with head and neck cancer experience significant disfigurement and dysfunction with altered body image disturbance.

Although research has advanced our understanding and knowledge of the characteristics of body image and body image disturbance, there is a lack of focus on the theoretical frameworks that interrogate the body image construct in individuals with head and neck cancer and the role of the face in formulating this construct.

Aim

This paper aims to appraise body image conceptual frameworks with an emphasis on the face as an integral organ in formulating body image.

Methods

Schilder's seminal body image conceptual framework was appraised and contrasted with that of Kolb's and Price's model as well as with the current evidence on body image disturbance in relation to the face.

Findings

Body image conceptual frameworks are valuable tools for understanding body image and body im-

age disturbances in individuals with head and neck cancer. However, Schilder's framework integrates the physiological, psychological and sociocultural aspects the body image.

Conclusion

Schilder's framework embodies body image and enables an integrated and inclusive approach to body image in individuals with head and neck cancer.

INTRODUCTION

Body image (BI) is the dynamic perception of one's own bodily appearance, function and sensations and the feelings associated with these perceptions.^{1,2} It is a multifaceted construct that is influenced by neurocognitive, psychosocial, physiological, cultural and pathological factors.^{3,4}

Head and neck cancers (HNC) comprise a heterogeneous group of malignancies in various anatomical subsites, including the oral cavity, pharynx, paranasal sinuses, nasal cavity, larynx and salivary glands.^{5,6} HNC constitutes 3% of all malignancies diagnosed in the United States and the United Kingdom^{5,7} and has significant morbidity, with a mortality rate of 16%.⁷

The treatment modalities for HNC involve ablative surgery with or without adjuvant therapy (i.e., chemotherapy and radiotherapy).⁸ The morbidity associated with HNC⁹ causes significant disturbances of BI.¹⁰ Unlike neoplasms occurring in other organs,

head and neck neoplasms are psychologically devastating, due to their visibility¹¹; as a result, BI theories have become valuable frameworks for understanding the BI and body image disturbances (BID) among this group of patients. This review explores Schilder's seminal conceptual framework of BI, examines the significance of the face in relation to BI and the implications of BID of the face. The application of the BI framework and BID are discussed in relation to individuals with HNC.

Conceptual Framework: Body Image

A number of conceptual frameworks for BI have been proposed^{3,4,12,13,14}, reflecting the challenges and complexities inherent with the BI construct. However, research has paid only limited attention to Schilder's model as a framework for BI in individuals with HNC. This discussion will focus on Schilder's model (1950)³, contrasting it with Kolb's model (1975)¹⁴ and Price's BI care model (1990).¹³ There is an increasing recognition of BID in individuals with HNC¹⁵ or other physical diseases.⁴ Schilder's model attempts to elucidate and interrogate the influence of the various elements of BI in such individuals and thus has the potential to be applied in an oncology setting.

Schilder's conceptual framework of BI

Schilder's conceptual framework of BI³ is grounded in Head's postural model of the body¹⁶ and explores domains that he referred to as physiology, the libidinous structure and sociology of BI. In Schilder's opinion, these reflected the construction of an individual's BI. Whilst Schilder did not define BI explicitly, there is an assertion that his definition of BI is embodied in the opening sentence of his book¹⁷:

The image of the human body means the picture of our own body which we form in our mind.^{3,pg 11}

He also argued that BI is not a mere sensation or imagination, as it also encompasses experiences that are stored in the cerebral cortex but are not necessarily part of one's central consciousness; further including our personalities and emotions influence our BI. He also contended that BI is a dynamic construct characterised by perpetual inner self-construction and self-destruction.^{3,pg15} As a tri-dimensional construct, Schilder explored the physiological basis of BI, including its libidinous structure and sociological aspects. Additionally, he proposed that BI begins to develop in utero and changes throughout the indi-

vidual's life.^{3,pg105} therefore, BI is a dynamic construct. He maintained that the aforementioned three facets contribute to BI development in a parallel, simultaneous, yet interactive and reciprocal fashion. Schilder described how, physiologically, the sensory and motor systems and the face (as well as other organs) facilitate physiological function and people's interactions with the world (social function). The libidinous structure of BI entails, for example, the love for oneself and the formation of the personality (ego), which is formed through tactile sensations and the psychogenic impressions thereof.

Although scholars of BI do not make direct inferences to Schilder's model, the model remains contemporaneous with current views of BI. An extensive body of knowledge affirms that BI is a dynamic multidimensional construct, as Schilder proposed.¹⁸ Furthermore, there has been a paradigm shift wherein the functionality of the body (or dysfunctionality), as opposed to the emphasis on the physical appearance of the body, is recognised as an integral element of BI.^{15,19} Interestingly, Thompson²⁰ was of the opinion that an inclusive and integrated framework is required. He also proposed the biopsychosociocultural framework, which has elements similar to those proposed by Schilder.³

People with HNC have numerous BI concerns that include perceptions and emotions related to altered physical appearance and functionality²¹ and challenges with social adjustment post-treatment.¹⁵ Thus, Schilder's model highlights the role of physiological, psychological and sociocultural elements that could potentially influence the development of BID in people with HNC.

Kolb's model of body image

Like Schilder's work, Kolb's model is also built on Head's work.¹⁶ Kolb¹⁴ proposed that body percept should be a term associated with BI, as observed from a neurological perspective. Body percept entails the sensory integration of past and present sensory experiences of the body in the sensory cortex. In contrast to Schilder's tri-dimensional construct, Kolb's construct of BI has two attributes: the body percept (physical body) and body concept (cognitive and emotive elements). The body concept includes a person's thoughts, feelings, attitudes and memories and evolves as the individual (the ego) views and experiences their body with others. The body ego is the perceiving aspect of the personality as it concerns the

BI, while the body ideal reflects how the individual measures the idealised precepts and concepts held of his or her body. The ego functions to integrate the disparities within the evaluations, which lead to arousal of either painful or pleasurable affect.¹⁴ In contrast to Schilder, Kolb's model emphasises the relationship between the somatosensory perception of the body and the cognitive-behavioural response mediated by the ego (personality). Whilst Schilder had an integrated approach and recognised the importance of the various domains in the construction of BI, Kolb posited that kinaesthetic and tactile sensations are the primary domains, and optic or olfactory sensory perceptions are secondary domains.

Kolb suggested that BID occurs within the context of the personality (ego). Thus, any disfigurement, as is the case with HNC patients, will result in a personality change. He proposed that it is the plasticity of an individual's personality that may inadvertently result in a healthy or pathological psychological response. He argued that poor adaptation manifests as various psycho-pathological responses or behaviours to alter BI. An example of this is the denial of the disfigurement, which can result in an individual being less compliant with treatment. Evidently, individuals with HNC often have maladaptive coping strategies such as denialism, self-blame and behavioural disengagement.^{22,23}

Price's model of body image

Price's model¹³ is comprised of three components, which he argued must be in equilibrium for an individual to have a satisfactory BI. The body reality refers to the body's physical existence with its genetically predetermined traits. The body ideal is the picture in our heads of how we would like the body to look; this is influenced by societal and cultural norms, the media and changing attitudes towards fitness and the body. Price related the model to individuals with eating disorders as an example to illustrate this point. Conceptually, the body ideal component is similar to Kolb's definition and emphasises the sociocultural factors that influence the perception of BI. Similarly, Schilder³ emphasised that BI is a social phenomenon; for example, others' BIs and attitudes influence an individual's BI. In HNC patients, the body ideal changes because of the disease process itself, and as a consequence of both ablative and rehabilitative surgeries, which negatively influence society's perceptions of the altered appearance.^{11,24} Body presentation is the third component of Price's model, which

represents the presentation of the body to the outside environment and draws attention to the symbolic value of the BI. This is similar to Schilder's libidinous structure of BI, as he argued that individuals change their BI by masking it with clothing. Similarly, people with an altered facial appearance due to HNC attempt to conceal or camouflage their appearance with clothing or sunglasses¹⁹, though this is difficult due to the high visibility of the face.^{25,2}

Although Price's model has been well received among the nursing community²⁷, one limitation is that it does not acknowledge the role of physiology or pathophysiology in the development of BI. Price¹³ argued that previous models of BI were complex, while his model simplifies the concept and makes it more applicable for nurses who encounter BID patients more often. However, this model does not take into consideration that, although the body reality may be altered, there is also a dysfunctionality associated with the altered BI^{1,28} and its psychological effects, as Schilder³ suggested. For example, surgical ablation of the lower jaw results in the inability to eat and communicate, which can possibly erode a person's self-confidence and self-esteem with diminished BI, resulting in manifestations of anxiety and depression.^{11,22,28} Dropkin et al.¹ proposed a conceptual framework of coping with disfigurement after HNC surgery, which recognised that HNC has a considerable impact on the physiological, psychological and social attributes of an individual's BI. This framework mirrors Schilder's tri-dimensional construct of BI, but also introduces the notion of BI reintegration, which recognises the necessity of identifying and appreciating the extent of the altered BI to facilitate post-operative strategies that promote the reintegration of BI.

Physiological and psychosocial significance of BI and the face

The face, head and neck areas are the most prominent and visible parts of the body, and they play a significant role in the BI schema.² The face has a dual role, as an organ of both identity and physiology.²⁹ In addition, Borah and Rankin³⁰ proposed a ternary role in identity, social interactions and physiological functions wherein the face integrates with the psychological processes. The functionality of the face they suggested is concordant with Schilder's model.

According to a number of authors, the face is the primary organ of an individual's identity and interac-

tions with others, including their representation of BI to the world.^{29,31} The face expresses the individual's inner self and personality^{32,pg13}, therefore it is an organ of self-expression through verbal and non-verbal cues^{29,33} and facilitates social interaction.³⁴ Communication through non-verbal cues reflects both positive and negative facial expressions, such as pain, deception³⁵, unpleasantness, happiness, anger and fear.^{33,36}

Physiologically, the face has numerous functions; for example, the eyes are a source of visual perception³¹ through which the self and world are experienced.^{32,pg14} Schilder³ was of the opinion that visual perception has a strong influence on BI. The ears and the nose perceive auditory and olfactory sensory input, respectively. Similarly, Schilder recognised that the ears play an important role in integrating the sensual experiences and construction of BI. The mouth expresses verbal emotions; the voice articulates an individual's intentions, ideas, perceptions, self-reflection and awareness whilst also facilitating mastication.^{31,32,pg13} As a sensory organ, the face transmits tactile stimuli perceived through the skin.²⁹ Schilder appreciated that the sensory organs afforded BI contact with the outside world, thus the face is integral in formulating BI.

In most cultures, the face is a symbol of attraction³⁷, as certain values are placed on its 'attractiveness'.³⁸ Dion et al.³⁹ observed there are stereotypes associated with the notion that 'What is beautiful is good'. That is, there are positive attributes associated with physical attractiveness. An attractive face has positive attributes that are socially desirable, which leads to better prospects for happy personal and professional lives.³⁹ Similarly, individuals with HNC express feelings of unattractiveness as a result of surgery and its related to changes to the face.^{19,25}

Cash et al.⁴⁰ identified the great importance that is placed on appearances and valuing specific body ideals, which they referred to as body-image investment. In their view, people spend most of their lives manipulating the way they look so that they are presented to the world in a positive light.⁴¹ This implies that physical appearance plays an important role in the world's perception of an individual. Furthermore, this perception is dynamic, as people can manipulate how they present themselves from one interaction to the next.⁴¹

Physiological and psychosocial implications of BI disturbance in individuals with head and neck cancer

Definition of body image disturbance

A variety of terms for BID have been suggested.^{13,28,42,43,44} For example, Engel and Keizer⁴⁵ proposed that BID is the disturbance in the visual aspects of the mental body representation. However, this definition is rather limited, as it does not take into consideration the functional and psychosocial factors that influence BI. According to Rhoten⁴⁶, the three defining attributes of BID in adults treated with cancer are self-perception of a change to appearance and displeasure with the change or perceived changes in appearance, a decline in the area of function and psychological distress regarding changes in appearance and/or function. Rhoten's definition correlates well with Schilder's BI conceptual framework.

Body image disturbance in individuals with head and neck cancer

Due to the close proximity of the vital structures in a small anatomic area, ablative surgery in the head and neck area is often radical⁹, causing significant disfigurement and BID.^{19,47} BID results in profound trauma for the individuals and continues to do so well after completion of the treatment.^{48,49} Existing data suggests that the prevalence of BID in HNC patients ranges from 75–77%¹⁰, with disfigurement and dysfunctionality being the main attributes of BID.⁵⁰

'Disfigurement' refers to the surgical removal of bony and/or soft tissues such that normal facial contour is permanently altered.⁹ Disfigurement can potentially bring permanent changes to a person's self-image, as endorsed by changes in physical appearance, sexual attractiveness and self-esteem.^{42,50} The altered self-image then affects their presentation of the self to the world⁴², thus patients have a diminished sense of self.¹¹ 'Dysfunction' denotes the associated sensorimotor deficit(s) that may occur as a result of the removal of vital structures.⁹ Dysfunction in HNC patients manifests as impaired verbal articulation and aphonia, which lessens the ability to communicate; reduced masticatory function; and a loss of vision, smell, hearing and/or taste.^{19,28} Schilder³ suggested that any change in function has an immediate influence on BI, therefore dysfunction can erode self-image and self-confidence¹¹, as the dysfunction is a constant reminder of the disease and lack of normality.¹⁹ Dysfunctionality is also associated with a

diminished sense of existential well-being.⁵¹

Schilder referred to this change of self as depersonalisation, a change in the self and the outside world.^{3,pg137} Depersonalisation is the failure to integrate the changed self and the re-establishment of a new meaning, thus it becomes a source of psychological and emotional impairment/distress. Schilder was of the view that every emotion has the potential to change the BI, as emotional attitudes are inseparable from sensory experiences. Both disfigurement and dysfunction are integral to BI, as a person's physiological experiences also cannot be separated from their psychological and social experiences. Furthermore, BID may be exacerbated by strangers' reactions to the disfigurement or dysfunctionality.^{19,51} Hence, in HNC patients, the reactions of others to their changed BI has a profound effect on their quality of life, leading to maladjustment or poor coping strategies, such as behavioural disengagement and social isolation.^{10,21,22} Schilder asserted that the 'BI is a social phenomenon'.^{3,pg217}

Lang et al.¹¹ conducted a systematic review and a meta-synthesis of 29 qualitative studies aimed at broadening the understanding of the psychological experiences of patients living with HNC. Themes that emerged included: uncertainty and hope, disruption with daily life, the diminished self, making sense of the experience, sharing the burden and finding a path to move forward with life. Generally, there was a sense that patients moved between hope and despair and struggled with disruptions to their daily lives and the uncertainty of the future caused by their cancer and its treatment. The disruption of daily life consequent to disfigurement and dysfunction was experienced in all aspects of life, ranging from mastication and verbal communication to relationships, socialising and self-identity disconnects. These findings support Schilder's³ view that suffering from any organic disease will bring about a change in self-perception and libidinous structure. Schilder also appreciated that depersonalisation can be a source of psychological impairment.

Bjordal et al.⁸ investigated the health-related quality of life (HRQL) of 357 HNC patients before, during and after cancer treatment. The European Organisation for Research and Treatment of Cancer and head and neck-specific questionnaires (QLQ-H&N 35) were used to assess HRQL at baseline, and after 1, 2, 3, 6 and 12 months. With a survival rate of 78%, only

218 (61%) of the participants had a complete follow-up during the different assessment phases through 12 months. The global assessment of the HRQL showed a deterioration in the first two months during treatment, but a return to baseline levels at 12 months' follow-up. However, the authors identified variables from the QLQ-H&N 35 that also had significantly poorer outcomes, such as swallowing, social eating, speech, pain, xerostomia and emotional functioning, none of which had improved at the 12-month follow-up, suggesting the long-term effects of BID. Consistent with these findings, Fingeret et al.²⁸ observed lower quality of life (QOL) scores in the emotional and functional domains, reflecting poor QOL outcomes related to dysfunctionality. The findings underpin Schilder's observations that physiological function is an attribute of BI, which in turn influences social function and affirms the importance of providing support in order to enhance BI reintegration.²

CONCLUSION

BI is a dynamic, multidimensional construct that encompasses the perception of an individual's physical appearance, function and the emotions associated with this perception.² The face, as the site of various organs, is fundamental in the formulation and development of BI. Through its varying functions, the face integrates the self with the environment and the body's psychological processes.³ HNC patients experience significant disfigurement and dysfunctionality consequent to HNC treatment¹⁰, with concomitant BID.¹¹ An extensive set of literature has highlighted that disfigurement and dysfunctionality in individuals with HNC⁴⁶ are sources of psychological distress¹¹ and contribute to poor QOL.⁸ Hence, BI theories are valuable frameworks for understanding BI and BID in this group of individuals.

Kolb's model emphasises the importance of the relationship between the somatosensory perception of the body and the cognitive-behavioural responses mediated by the ego (personality); therefore, BID occurs in this context. Price¹³, by contrast, argues that a satisfactory BI is manifest when the three domains of BI (body reality, body ideal and body presentation) are in equilibrium. The limitation of both of these models is their lack of consideration for the dysfunctionality commonly found in HNC patients and the concomitant psychosocial distress.

Schilder appreciates the complexities of BI and that it is not the mere 'picture of our own body which we

form in our minds'.^{3, pg11} His framework embodies BI and allows for an integrated and inclusive approach to BI in individuals with HNC. This framework may be integrated into comprehensive care for HNC to identify patients at risk, and to assess and proactively address potential BID related to visible bodily changes (disfigurement), dysfunction (e.g., impaired verbal articulation, loss of vision, reduced masticatory function) and adverse psychosocial outcomes (e.g., anxiety, depression). Thus, his conceptual framework of BI remains contemporaneous with the current views of BI and current research lines, as evidenced by the recognition of function/dysfunction as an important aspect of BI¹⁸ and the proposal for an integrated biopsychosociocultural framework.²⁰

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KEY MESSAGES

- Body image theories are important for elucidating body image disturbances in individuals with head and neck cancer. According to Schilder's tri-dimensional construct, the face is integral in the formulation and development of body image.
- The aim of the paper is to appraise Schilder's body image conceptual framework with emphasis on the face as an integral organ in formulating body image.
- As a tri-dimensional construct, Schilder explored the physiological basis of body image, including its libidinous structure and sociological aspects. Thus, within this construct and in relation to the face, the defining attributes of body image disturbance are self-perceived changes to appearance and displeasure with these change, the decline in the area of function and psychological distress regarding changes and/or function.
- In short, Schilder uses an integrated approach to appreciate the complexities of body image and body image disturbances.

REFERENCES

1. Dropkin MJ. Coping with disfigurement and dysfunction after head and neck cancer surgery: A conceptual framework. *Semin Oncol* 1989; 5(3):213–9.
2. Dropkin MJ. Body Image and quality of life after head and neck cancer surgery. *Cancer Pract* 1999; 7(6): 309–13. doi: 10.1046/j.1523-5394.1999.76006.x
3. Schilder P. The image and appearance of the human body: Studies in the constructive energies of the psyche. [place unknown]: The International Library of Psychology; 1950.
4. Pruzinsky T, Cash T. Understanding body image. A historical and contemporary perspective. In: Cash TF, Pruzinsky T, editors. *Body Image: A handbook of theory, research and clinical practice*. New York: Guilford Press; 2002. p. 3–12.
5. Mourad M, Jetmore T, Jategaonkar AA, Moubayed S, Moshier E, Urken ML. Epidemiological trends of head and neck cancer in the United States: A SEER population study. *J Oral Maxillofac Surg* 2017; 75(12):2562–22. doi: 10.1016/j.joms.2017.05.008
6. Silva P, Harker N [Internet]. Head and neck cancer: Early diagnosis and treatment are key; 2018 [27 Sept 2020]. Available at: <https://www.guidelinesinpractice.co.uk/cancer/head-and-neckcancer-early-diagnosis-and-treatment-are-key/453995.article>
7. Cancer Research UK [Internet]. Head and neck cancers. [2019 Nov 01;2020 April 04]. Available at: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancertype/head-and-neckcancers?ga=2.200766574.1550471946.1601128020-1328724311.1601128020>
8. Bjordal K, Ahlner-Elmqvist M, Hammerlid E, Boysen M, Evensen JF, Björklund A, et al. A prospective study of quality of life in head and neck cancer patients. Part II: Longitudinal data. *Laryngoscope* 2001; 111(8):1440–52. doi: 10.1097/00005537-200108000-00022.
9. Dropkin MJ. Anxiety, coping strategies, and coping behaviours in patients undergoing head and neck cancer surgery. *Cancer Nurs* 2001; 24(2):143–8. doi: 10.1097/00002820-200104000-00010
10. Fingeret MC, Yuan Y, Urbauer D, Weston J, Nipomnick S, Weber R. The nature and extent of body image concerns among surgically treated patients with head and neck cancer. *Psychooncology* 2012; 21(8):836–44. doi: 10.1002/pon.1990
11. Lang H, France E, Williams B, Humphris G, Wells M. The psychological experience of living with head and neck cancer: A systematic review and meta-synthesis. *Psychooncology* 2013; 22(12):2648–63. doi: 10.1002/pon.3343
12. Higgins ET. Self-discrepancy: A theory relating self and affect. *Psychol Rev* 1987; 94(3): 319. doi:10.1037/0033-295X.94.3.319
13. Price B. A model for body-image care. *J Adv Nurs* 1990; 15(5):585–93. doi: 10.1111/j.1365-2648.1990.tb01858.x
14. Kolb LC. Disturbances of the body image. *American handbook of psychiatry*. USA: International Psychotherapy Institute; 1975.
15. Rhoten B, Murphy B, Ridner SH. Body image in patients with head and neck cancer: A review of the literature. *Oral Oncol* 2013; 49(8): 753–60. doi: 10.1016/j.oraloncology.2013.04.005
16. Head H. *Studies in neurology*. Vol. 2. London: Oxford University Press; 1920.
17. Hanley F. The dynamic body image and the moving body: Revisiting Schilder's theory for psychological research. *Scan Journal* 2005; 2(2) [pages unknown]. http://scan.net.au/scan/journal/display.php?journal_id=60
18. Atkinson MJ, Stock NM, Alleva JM, Jankowski GS, Piran N, Riley S, et al. Looking to the future: Priorities for translating research to impact in the field of appearance and body image. *Body Image* 2020; 32:53–61. doi:10.1016/j.bodyim.2019.10.006
19. Ellis MA, Sterba KR, Day TA, Marsh CH, Maurer S, Hill EG, et al. Body image disturbance in surgically treated head and neck cancer patients: A patient-centered approach. *Otolaryngol Head Neck Surg* 2019; 161(2):278–87. doi: 10.1177/0194599819837621
20. Thompson, AR. Researching appearance: Models, theories and frameworks. In: Rumsey N, Harcourt D, editors. *Oxford library of psychology. The Oxford handbook of the psychology of appearance*. Oxford: Oxford University Press; 2012. doi.org/10.1093/oxfordhb/9780199580521.001.0001
21. Clarke SA, Newell R, Thompson A, Harcourt D, Lindenmeyer A. Appearance concerns and psychosocial adjustment following head and neck cancer: A cross-sectional study and nine month follow-up. *Psychol Health Med* 2014; 19(5):505–18. doi: 10.1080/13548506.2013.855319
22. Horney DJ, Smith HE, McGurk M, Weinman J, Herold J, Altman K, et al. Associations between quality of life, coping styles, optimism, and anxiety and depression in pre-treatment patients with head and neck cancer. *Head Neck* 2011;33(1): 65–71. doi:10.1002/hed.21407

23. Reich M, Leemans CR, Vermorken JB, Bernier J, Licitra L, Parmar S, et al. Best practices in the management of the psycho-oncologic aspects of head and neck cancer patients: Recommendations from the European Head and Neck Cancer Society Make Sense Campaign. *Ann Oncol* 2014; 25(11): 2115–24. doi: [10.1093/annonc/ndu105](https://doi.org/10.1093/annonc/ndu105).
24. Vickery LE, Latchford G, Hewison J, Bellew M, Feber T. The impact of head and neck cancer and facial disfigurement on the quality of life of patients and their partners. *Head Neck* 2003; 25(4):289–96. doi: [10.1002/hed.10206](https://doi.org/10.1002/hed.10206)
25. Henry M, Ho A, Lambert SD, Carnevale FA, Greenfield B, MacDonald C, et al. Looking beyond disfigurement: The experience of patients with head and neck cancer. *J Palliat Care* 2014; 30(1): 5–15. doi: [10.1177/082585971403000102](https://doi.org/10.1177/082585971403000102)
26. Fingeret MC, Teo I, Goetsch K. Body image: A critical psychosocial issue for patients with head and neck cancer. *Curr Oncol Rep* 2015; 17(4):22. doi: [10.1007/s11912-014-0422-0](https://doi.org/10.1007/s11912-014-0422-0).
27. Newell RJ. Altered body image: A fear-avoidance model of psycho-social difficulties following disfigurement. *J Adv Nurs* 1999; 30(5):1230–8. doi: [10.1046/j.1365-2648.1999.01185.x](https://doi.org/10.1046/j.1365-2648.1999.01185.x)
28. Fingeret MC, Hutcherson KA, Jensen K, Yuan Y, Urbauer D, Lewin JS. Associations among speech, eating, and body image concerns for surgical patients with head and neck cancer. *Head Neck* 2013; 35(3):354–60. doi: [10.1002/hed.22980](https://doi.org/10.1002/hed.22980)
29. Rifkin WJ, Kantar RS, Ali-Khan S, Plana NM, Diaz-Siso JR, Tsakiris M, et al. Facial disfigurement and Identity: A review of literature and implications for facial transplantation. *AMA J Ethics* 2018;20(4):309–23. <https://journalofethics.ama-assn.org/sites/journalofethics.ama-assn.org/files/2018-06/peer1-1804.pdf>
30. Borah GL, Rankin MK. Appearance is a function of the face. *Plast Reconstr Surg* 2010; 125:873–8. doi: [10.1097/PRS.0b013e3181cb613d](https://doi.org/10.1097/PRS.0b013e3181cb613d)
31. Callahan C. Facial disfigurement and sense of self in head and neck cancer. *Soc Work Health* 2005; 40:73–87. doi: [10.1300/J010v40n02_05](https://doi.org/10.1300/J010v40n02_05)
32. Talley HL. *Saving face: Disfigurement and the politics of appearance*. New York: New York University Press; 2014. doi: [10.1111/1467-9566.12290](https://doi.org/10.1111/1467-9566.12290)
33. Frith C. Role of facial expressions in social interactions. *Phil Trans R Soc* 2009; B364:3453–3458. doi: [10.1098/rstb.2009.0142](https://doi.org/10.1098/rstb.2009.0142)
34. Jack RE, Schyns PG. The human face as a dynamic tool for social communication. *Curr Biol* 2015; 25(14):R621–34. doi: [10.1016/j.cub.2015.05.052](https://doi.org/10.1016/j.cub.2015.05.052).
35. Hill ML, Craig KD. Detecting deception in pain expressions: The structure of genuine and deceptive facial displays. *Pain* 2002; 98(1–2):135–44. doi: [10.1016/s0304-3959\(02\)00037](https://doi.org/10.1016/s0304-3959(02)00037)
36. Ekman P. Facial expression and emotion. *Am Psychol* 1993; 48(4):384–92. doi: [10.1037/0003-066X.48.4.384](https://doi.org/10.1037/0003-066X.48.4.384)
37. Jones D, Hill K. Criteria of facial attractiveness in five populations. *Hum Nat* 1993; 4:271–96. doi: [10.1007/BF02692202](https://doi.org/10.1007/BF02692202)
38. Lorenzo GL, Biesanz JC, Human LJ. What is beautiful is good and more accurately understood. Physical attractiveness and accuracy in first impressions of personality. *Psychol Sci* 2010; 21(12):1777–82. doi: [10.1177/0956797610388048](https://doi.org/10.1177/0956797610388048)
39. Dion K, Berscheid E, Walster E. What is beautiful is good. *J Pers Soc Psychol* 1972; 24(3):285–90. doi: [10.1037/h0033731](https://doi.org/10.1037/h0033731)
40. Cash TF, Melnyk SE, Hrabosky JL. The assessment of body image investment: An extensive revision of the appearance schemas inventory. *Int J Eat Disord* 2004; 35(3):305–16. doi: [10.1002/eat.10264](https://doi.org/10.1002/eat.10264)
41. Rumsey N, Harcourt D. Body image and disfigurement: Issues and interventions. *Body Image* 2004; 1(1):83–97. doi: [10.1016/S1740-1445\(03\)00005-6](https://doi.org/10.1016/S1740-1445(03)00005-6)
42. Dropkin MJ, Malgady RG, Scott DW, Oberst MT, Strong EW. Scaling of disfigurement and dysfunction in postoperative head and neck patients. *Head Neck* 1983; 6:559–70. doi: [10.1002/hed.2890060104](https://doi.org/10.1002/hed.2890060104)
43. Przedzicki A, Sherman KA, Baillie A, Taylor A, Foley E, Stalgis-Bilinski K. My changed body: Breast cancer, body image, distress and self-compassion. *Psychooncology* 2013; 22(8):1872–9. doi: [10.1002/pon.3230](https://doi.org/10.1002/pon.3230)
44. Rhondali W, Chisholm GB, Filbet M, Kang DH, Hui D, Cororve Fingeret M, et al. Screening for body image dissatisfaction in patients with advanced cancer: A pilot study. *J Palliat Med* 2015; 18(2):151–6. doi: [10.1089/jpm.2013.0588](https://doi.org/10.1089/jpm.2013.0588)
45. Engel M, Keizer A. Body representation disturbances in visual perception and affordance perception persist in eating disorder patients after completing treatment. *Sci Rep* 2017; 7(1):1–9. doi: [10.1038/s41598-017-16362-w](https://doi.org/10.1038/s41598-017-16362-w)
46. Rhoten BA. Body image disturbance in adults treated for cancer - a concept analysis. *J Adv Nurs* 2016; 72(5):1001–11. doi: [10.1111/jan.12892](https://doi.org/10.1111/jan.12892)
47. Fingeret MC, Vidrine DJ, Reece GP, Gillenwater AM, Gritz ER. Multidimensional analysis of body image concerns among newly diagnosed patients with oral cavity cancer. *Head Neck* 2010; 32(3):301–9. doi: [10.1002/hed.21181](https://doi.org/10.1002/hed.21181) Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2821979/>
48. Rapoport Y, Kreitler S, Chaitchik S, Algor R, Weissler K. Psychosocial problems in head and neck cancer patients and their change with time since diagnosis. *Ann Oncol* 1993; 4(1):69–73. doi: [10.1093/oxfordjournals.annonc.a058365](https://doi.org/10.1093/oxfordjournals.annonc.a058365)
49. Graboyes EM, Hill EG, Marsh CH, Maurer S, Day TA, Sterba KR. Body image disturbance in surgically treated head and neck cancer patients: A prospective cohort pilot study. *Otolaryngol Head Neck Surg* 2019; 161(1):105–10. doi: [10.1177/0194599819835534](https://doi.org/10.1177/0194599819835534)
50. Teo I, Fronczyk KM, Guindani M, Vannucci M, Ulfers SS, Hanasono MM, et al. Salient body image concerns of patients with cancer undergoing head and neck reconstruction. *Head Neck* 2016; 38(7):1035–42. doi: [10.1002/hed.24415](https://doi.org/10.1002/hed.24415)
51. Röing M, Hirsch JM, Holmström I, Schuster M. Making new meanings of being in the world after treatment for oral cancer. *Qual Health Res* 2009; 19(8):1076–86. doi: [10.1177/1049732309341192](https://doi.org/10.1177/1049732309341192)