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Doota adhyaya of Bhela indriya sthana - An explorative study

Abstract

'Maharshi Bhela' belongs to *samhita* period (100 BC - 400 BC) and he has composed an *Ayurvedic* treatise known as '*Bhela samhita*'. *Bhela samhita* is divided in to 8 sections and 120 chapters. *Indriya sthana* is one among the 8 sections of '*Bhela samhita*' and it comprised of 12 chapters. Like '*Indriya sthanas*' of other ancient *Ayurvedic* texts, '*Bhela indriya sthana*' also deals with *arishta lakshanas* (fatal signs and symptoms) and other prognostic aspects. '*Doota adhyaya*' is the 8th chapter of '*Bhela indriya sthana*' which comprises of 16 verses dealing with estimation of prognosis based on the characteristic features of caregiver (*doota*). Estimating prognosis based on the phenotypic characteristics of caregiver is the unique contribution of *Ayurveda* and '*Maharshi Bhela*' has allotted a separate chapter for this in '*Indriya sthana*' (*doota adhyaya*). The contents of '*doota adhyaya*' are unique and needs further in-depth exploration. Previous works conducted on '*Charaka indriya sthana*' and '*Bhela indriya sthana*' have explored various neglected concepts having prognostic importance. Studies on '*Doota adhyaya*' of '*Bhela indriya sthana*' have been lacking and the present study is aimed to explore the contents of this chapter in terms of their prognostic significance. Thousands of years ago, '*Maharshi Bhela*' has identified and documented concepts like caregiver burden & distress, factors determining the impact of caregiving on caregivers, desirable or positive personality characteristics of a caregiver and their influence on prognosis and role and impact of geographical, cultural, economic, social and personality characteristics of a caregiver on caregiving and prognosis of a disease condition of the patient or care recipient. Concepts of '*Jyotishya shastra*' (astrology) and '*Nimitta*' or '*Shakuna shastra* (astrology of omens)' were also incorporated in assessing the prognosis. Further works are required to establish the facts mentioned in this chapter.

Keywords: Caregiver, *Charaka indriya sthana*, Caregiver burden, Caregiver distress, *Doota,* Prognosis

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Abbreviations: PD, Parkinson's disease; FTD, Frontotemporal dementia; ASD, Autism spectrum disorder; ID, Intellectual disability; OCD, Obsessive compulsive disorder; ADHD, Attention-deficit / hyperactivity disorder; CSTC, Cortical-striatal-thalamo-cortical; NB, Nail biting; ODD, Oppositional defiant disorder; MR, Mental retardation; SAD, Separation anxiety disorder; MDD, Major depressive disorder; PDD, Pervasive developmental disorder; TS, Tourette syndrome; CAPD, Central auditory processing disorder; TBI, Traumatic brain injury; LI, Language impairment; SSD, Speech sound disorder; ALS, Amyotrophic lateral sclerosis; CVA, Cerebrovascular accidents; CAS, Childhood apraxia of speech; CP, Cerebral palsy; VPD, Velopharyngeal dysfunction; MS, Multiple sclerosis; PVFM, Paradoxical vocal fold motion disorder; VCD, Vocal cord dysfunction; GAD, Generalized anxiety disorder; CNS, Central nervous system; ADL, Activities of daily living; IADL, Instrumental activities of daily living; BPSD, Behavioural and psychological symptoms of dementia; EOL, End-of-life;

Introduction

Maharshi Bhela, *Agnivesha*, *Jatukarna*, *Parashara*, *Harita* and *Ksharapani* were colleagues and disciples of '*Acharya Punarvasu Atreya*'. '*Maharshi Bhela*' has composed an *Ayurvedic* treatise known as '*Bhela samhita*'. *Bhela samhita* belongs to 1000 BC - 2000 BC and it was quoted by a number of authors and commentators till the medieval period. Planning and arrangement of the contents in the '*Bhela samhita'* is similar to that of '*Charaka samhita*' but the former is incomplete in many aspects. *Bhela samhita* has a number of peculiar ideas which were neglected and unexplored till date.[1] *Bhela samhita* consists of 120 chapters divided among 8 sections similar to that of '*Charaka samhita*'. '*Indriya sthana*' is one among the eight sections of '*Bhela samhita'* (consists of 12 chapters) which is again similar to that of '*Charaka indriya sthana*' but with few exceptions. '*Indriya sthana'* deals with various fatal signs and symptoms (*arishta lakshanas*) which leads to an imminent death.[2]

'*Doota adhyaya*' is the 8th chapter of '*Bhela indriya sthana*' which consists of 16 verses. This chapter deals with estimation of prognosis based on the characteristic features of caregiver or messenger (*doota*). Estimating prognosis based on the phenotypic characteristics of caregiver is unique contribution of *Ayurveda* and '*Maharshi Bhela*' has allotted a separate chapter for this in '*Indriya sthana*' (*doota adhyaya*).[3,4] Previous works conducted on '*Charaka indriya sthana*'[5-17] and '*Bhela indriya sthana*' [18] have explored various hidden and under explored concepts which are having clinical and prognostic significance. The contents of '*doota adhyaya*' are unique and needs further in-depth exploration. There is a perception that the concepts related to '*doota'* are bad omens and doesn't have scientific basis. The present study also focused on to evaluate the contents of '*doota adhyaya*' in scientific terms. Studies on '*Doota adhyaya*' of '*Bhela indriya sthana*' have been lacking and the present study is aimed to explore the contents of this chapter in terms of its prognostic significance and contemporary relevance.

Review methodology

A literature search was undertaken. Both 'Google' and 'Google scholar' databases were used for search. Full text articles with

open access and abstracts published in English language were only considered. Articles published until 30 September 2020, were only considered irrespective of their publication year or date of appearance. *Ayurvedic* literature (books and articles) published on '*Indriya sthana*', '*Charaka indriya sthana*', '*Bhela indriya sthana*', and '*Arishta lakshanas*' was considered. Relevant articles of contemporary medicine (especially literature pertaining to caregiver) have been searched from electronic databases by using relevant key words. No filters were applied during search.

Discussion

The word '*doota'* denotes either messenger (who comes to call the physician to the patient's house) or caregiver (either a family member or relative or friend or nurse who has taken the responsibility to provide care to the patient). Concept of '*doota'* is an interesting and unique topic found in various *Ayurvedic* classical texts. '*Doota adhyaya*' deals with the prognostic assessment of a disease of the patient based on the phenotypic or behavioural characteristics displayed by the messenger or caregiver (*doota*). Various bad omens pertaining to *doota* and their influences on prognosis were also mentioned in this chapter. When *doota* comes to physician's house to call him for the treatment of the patient concerned, the physician should carefully observe the behavioural characteristics displayed by a '*doota'* and also bad omens which occurs during that time. Proper understanding of the *aristha lakshanas* explained in this chapter will be helpful for the physician in prognostic decision making. Physician should avoid the home visit to the housebound patient in the presence of *arishta lakshanas* pertaining to *doota* mentioned in this chapter.[3,4] This chapter contains 16 verses which have been explored in the following sections with special regard to their contemporary relevance and prognostic significance (Table 1).

Table 1 Caregiver characteristics and their impact on caregiving

Domain / Feature of a caregiver	Outcome status or risk factors of caregiving
'*Trunaan nakhaan va chhindan*' (B. I. 8 / 1)	Stereotypic motor behaviours & Nail biting in caregiver denotes caregivers physical health issues, caregiver burden and distress which ultimately affects quality of caregiving and hastens patients mortality;
'*Viplutam bhaashamaanashcha*' (B. I. 8 / 2)	Irrelevant or inappropriate or abnormal speech in caregiver denotes caregivers impaired communication abilities which ultimately affects quality of caregiving and various negative outcomes;
'*Bhinatti kashtam kashtena loshtam loshtena*' (B. I. 8 / 3)	Inadequate resources, poverty and poor financial conditions of caregiver affects caregiving process and quality;
'*Sprushan angaani baalaamshcha*' & '*Pidhaaya paanina naabhim*' (B. I. 8 / 4 & 5)	Body-focused behaviours & motor stereotypies in caregiver denotes caregivers poor physical health status which ultimately affects quality of caregiving;
'*Kapaalikaam sharkaraam bhinatti angaarikaam*' (B. I. 8 / 6)	Financial costs of caregiving, caregiving burden and poverty and their impact on caregiving which ultimately may leads to negative outcomes in care recipient's health status;
'*Aaste bhumau parishraanto gruhnaati angamatha bhraman*' (B. I. 8 / 7)	Faintness or presyncope or extreme fatigue in caregiver denotes poor physical health status which ultimately impacts caregiving process negatively;
'*Nashtam mrutam atikraantam iti vadet dooto*' (B. I. 8 / 8)	Negative personality traits of a caregiver and their negative impact on caregiving & care recipient's health;
'*Karam karena gruhnaati paaninaa taadayet karam*' '*Khaadedaushtau jihwaam nakhaan dantaishcha kalpayet*' (B. I. 8 / 9 & 10)	Stereotypic motor behaviours, Nail biting, lip biting in caregiver denotes caregivers poor physical health, caregiver burden and distress which ultimately affects quality of caregiving and hastens patients mortality;
'*Aaturasya gruhe chhidyate bhidyate chaiva*' (B. I. 8 / 11)	Hostile family environment or unhealthy behaviours of family members (of care recipients) denotes caregiver burden or distress which ultimately affects caregiving process and negative health outcomes in care recipient;
'*Paraavartya ghatam purnam brahmanam*' (B. I. 8 / 12)	Bad omens and their influences on the prognosis of care recipients medical condition;
'*Grudhra srugaala kaaka ulooko vaayasa nadeyu dakshine parshwe rogino*' (B. I. 8 / 13)	Behaviour of scavenger birds towards patients at end-of-life stages; *Shakuna shastra*;
'*Kashaya vastra, mundita, jatila, charmabhirva parivruta & shaatika*' '*Mahaanasee*' '*Nagnaka, vaagmi & unmatta*' '*Chinna nasa*' '*Tailabhyakta, bhagnaushta & kharavaata*' (B. I. 8 / 14 & 15)	Negative impact of various factors such as religious and cultural diversity between caregiver and receiver, employment status of a caregiver, physical & mental health status of a caregiver, communication abilities of a caregiver and loyalty or faithfulness of a caregiver etc on caregiving quality and care recipient's health status;

(B. I. 8 / XX): B - *Bhela samhita*; I - *Indriya sthana*; 8 - Eigth chapter; X - *Verse* number

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Who is *doota*?

Doota is the person who conveys the message regarding patient's general condition and requests the physician for home visit. In ancient times due to the lack of communication media the way of communicating information was manual only. It the responsibility of *doota* to convey the message regarding patient's medical condition to the physician. Physicians carefully assess the phenotypic characteristics and behaviour of *doota* to assess the prognosis of a remote unseen patient. As *doota* conveys the message, he can be called as 'messenger'. *Doota* is the person who provides care to the patient hence he can also be called as caregiver. The word '*doota'* mentioned in *Ayurvedic* classics denotes either a messenger or caregiver or both.[4,16] The words 'messenger', 'caregiver' and '*doota'* have been used synonymously throughout the present article. The words 'patient' and 'care recipient' have also been used synonymously throughout the present article.

What are the responsibilities of *doota*?

Caregiver provides physical and psychological care for a person in need (patient / care recipient). Caregivers can be professional (such as nurses) or informal (typically family members or friends or relatives) who provide care to individuals with a wide variety of conditions such as advanced age, dementia, and cancer. Most caregivers are often family members, and usually they are unpaid.[18] Caregivers may live with the ill individual and may involve in activities related to patients such as bathing, feeding, dressing, toileting, house cleaning, cooking, shopping, taking the patient to medical appointments and serving as the medical interpreter. The caregiver must also identify and treat disease-related symptoms, administering medications, observing for side effects, monitoring for drug interactions, and changing wound dressings. Caregivers become not only a conduit for information between patient and physician, but with the extended family.[19] Conveying information between patient and physician and also arranging home visits are the main duties of caregiver as explained in '*doota adhyaya*'.

Whether caregiving causes burden or distress?

Due to the multiple concurrent stressful events and unrelenting stress, caregivers often experience negative health effects. Caregiver burden can be defined as "a multidimensional response to physical, psychological, emotional, financial and social stressors associated with the caregiving experience". Signs and symptoms of caregiving stress are often psychological problems such as anxiety, depression, worry, emotional distress, loneliness, fatigue, sleep disturbances and unhealthy behaviours. Various attributes like *deena* (depression), *bheeta* (anxiety/low self esteem), *druta* (anxiety / restlessness / irritability) and *trasta* (fatigue) explained in '*Gomaya churneeyam*' of '*Charaka indriya sthana*' denotes caregiver burden or distress.[16] Caregiver burden was associated with the caregiver being married and younger. Caregiver burden is more prevalent in carers of patients presenting more neuropsychiatric symptoms (dementias) and with more comorbidities. In addition to depression and anxiety, caregivers experience grief also. Caregiver grief correlates inversely with family support.[20] Most of the caregivers are usually untrained and often feel ill prepared to take on caregiving tasks. Risk factors for caregiver burden include female gender, low educational attainment, residing with the patient, social isolation, depression, financial stress, higher number of hours spent caregiving, lack of choice in being a caregiver, around-the-clock care obligations, high or increasing care needs (such as dementia, cancer, functional decline, end-of-life care), and care transitions are all substantial risk factors for caregiver burden. Caregivers become "the invisible patient".[21] Caregiving can also be daunting, physically and emotionally challenging, and isolating. The physical well-being of caregivers is often compromised due to an excessive physical effort involved in caregiving.[22] Unrelenting caregiver stress can also have an impact on the caregiver's physical health, which may leads to the manifestation of high blood pressure, diabetes, a compromised immune system, and a shorter life expectancy. Often, many caregivers are not aware that they are physically ill and emotionally exhausted. This burnout is referred to as "caregiver syndrome".[23] The caregiver stress process generated by the care situation, socio-demographic characteristics (i.e., as age, gender, educational level, marital status, and social class of the caregiver, relationship with and gender of the patient) are related to primary stressors (i.e., the patient's disease, dependence level of the patient, duration and daily hours of care), and that primary and secondary stressors (i.e., employment, monthly family income and caregivers' self-esteem) are related to caregivers' emotional state.[24] The job of caregiving is burdensome and it definitely affects the physical and psychological health of caregivers negatively.

Whether caregivers' poor health (caregivers' burden) predicts mortality of their concerned patients / care recipients?

The whole chapter of '*doota adhyaya*' deals with caregiver's poor health status and its relationship with concerned patient's mortality. Physicians analyze various physical and psychological features of a caregiver and based on that they estimate the prognosis of the concerned care recipient / patient.[3,4] Decline in caregiver mental health is a plausible risk factor for patient mortality in several ways. Worse mental health in caregivers can influence the quality of care (patient neglect and abuse) they provide, weakens the social bond between them (caregivers often feel lonely and isolated) and patients and negatively influences patients (through emotion contagion or behavioural mimicry). Low-quality relationship functioning between caregiver and patient has been linked to poorer physical health, impaired immune functioning, and mortality in patients. Caregiver mental health has it influence on patient's mortality, the inverse may also be true (i.e., worse mental health in patients would likely to hasten patient mortality and it could also promote worse caregiver mental health). The stresses and burden of caregiving create increased risk for poor caregiver mental health, which can leads to greater mortality among care recipients/patients.[25] *Maharshi Bhela* has established the same facts in '*doota adhyaya*' chapter.

'*Trunaan nakhaan va -- pratyaakhyeya stathavidha*' (*Verse* 1)[3]

If a messenger or caregiver (*doota*) displays behaviours such as plucking (*chhindan*) the grass blades (*trunaan*) and biting (*chhindan*) his nails (*nakhaan*) with his teeth during the interaction with physician (*vai bhishajam paripruchhati*), he (such type of a messenger) should be repulsed (*pratyaakhyeya stathavidha*) or physician should avoid home visit to the concerned housebound patient (care recipient or patient) (*aaturasya yadaa doota*).[3] Stereotypical motor behaviours (*trunaan chhindan*) can be seen in a wide variety of conditions such as autism, tardive dyskinesia, excessive dopaminergic treatment of PD, FTD, tic disorders, motor mannerisms, compulsion and habit.[26] Stereotypies (*trunaan chhindan*) often refer not only to movements, but also to other repetitive behaviours (*trunaan chhindan*) such as postures, utterances and sniffing. Primary stereotypies can be classified into two groups, common (e.g., pencil tapping, nail biting - *nakhaan chhindan*, hair twisting etc) and complex (e.g., hand flapping, finger

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wiggling, waving etc) (*trunaan chhindan*). The CSTC brain circuits have been linked to movement initiation, continuation, termination and other psychiatric disorders such as ADHD, OCD, and Tourette's disorder.[27] NB (*nakhaan chhindan*) is "putting one or more fingers in the mouth and biting on nail with teeth". NB (*nakhaan chhindan*) is related to behavioural problems and anxiety. NB (*nakhaan chhindan*) occurs as a result of boredom or working on difficult problems rather than anxiety. Most common co-occurring psychiatric disorders with NB (*nakhaan chhindan*) are ADHD, ODD, SAD, enuresis, tic disorder, OCD, MDD, MR, PDD, and TS. The most common co-occurring stereotypic behaviours were lip biting, head banging, hair-pulling, skin-picking, and others.[28] '*Trunaan chhindan*' and '*nakhaan chhindan*' denotes stereotypic motor behaviours and NB due to various associated neurological & psychiatric conditions and they adversely affects the caregiving quality and likely to hasten patients mortality. The present verse indicates compromised caregiving due to caregiver's poor physical or psychiatric health (anxiety or depression or other neurological and psychiatric conditions) which is associated with patient mortality. Hence physician's home visit of such type of house bound patient (who is having sick caregiver) would be futile.

'Viplutam bhaashamaanashcha -- pratyaakhyeya stathavidha' (Verse 2)[3]

The word '*vipulta bhaashamaana*' denotes an abnormal speech such as confused or irrelevant or inappropriate speech or stuttering or stammering. The physician should not do the home visit of a patient, whose '*doota'* speaks inappropriately or irrelevantly or incoherently. Speech and language pathology (*vipulta bhaashamaana*) can be seen in various conditions such as hearing disorders (sensorineural, conductive and mixed hearing loss), CAPD, MR, cognitive-communication disorder in TBI, stuttering & cluttering disorders, LI or language disorders, myofunctional disorders, SSD, voice & resonance disorders, social communication disorder, ALS, aphasia in CVA, CAS, ASD, CP, oral-facial clefts (cleft lip & cleft palate), VPD, dementia, delirium, dysarthria, dysphagia, head & neck cancer, MS, neurological motor speech disorder, PVFM or VCD, PD and other neurological & psychiatric conditions.[29] Communication is a key element of high quality care especially in end-of-life care. The scope and timing of communication between caregiver and the physician is particularly important. Disparities between what physicians think they are communicating and what caregivers hear communicated are very important to understand.[30] Improved caregiver communication skills have the potential to reduce caregiver burden, frustration and improve care recipient or patient's health. Improved communication between caregivers, their patients and physicians has the potential to reduce confusion and errors during the process of care and also reduce caregiver burden.[31] Efficient and effective communication is crucial in healthcare. In face-to-face communication, all involved parties (*doota* & *bhishak*) can not only hear what is being said but also they can see the facial expression and body language that provide key information so they can better understand the meaning behind the words. Inefficient communication has several potentially negative consequences, for all involved in the caregiving process. Poor communication (*vipulta bhaashamaana*) can indeed lead to various negative outcomes (*pratyaakhyeya stathavidha*) such as discontinuity of care, compromise of patient safety, inefficient use of valuable resources, dissatisfaction in overworked physicians and also economic consequences.[32] As per the present verse, the caregiver suffering with speech and language pathology may not communicate properly with the physician and patient that may be associated with compromised caregiving process and ultimately affects prognosis of the concerned patient.

'Bhinatti kaashtam kaashtena -- pratyaakhyeya stathavidha' (Verse 3)[3]

When a patient's messenger breaks a piece of wood with another such piece (*bhinatti kaashtam kaashtena*) and breaking a piece of clay with another such piece (*bhinatti loshtam loshtena*) while communicating with physician, he should be repulsed (physician should avoid home visit of concerned patient) (*pratyaakhyeya stathavidha*). Sharp knives, saw, drilling machines, machete, axe, hatchet, hammer, chisel, router and lathe etc tools are required to cut the wood and to break the clay in to pieces but breaking wood and clay piece with another such pieces denotes lack of those tools. Lack of the essential tools or basic requirements denotes inadequate resources or poverty or poor financial conditions of the caregiver and/or care recipient that may adversely affect quality care. Physician can assess the financial condition and availability of the required basic resources for proper health care of the concerned patient by observing the tools used by the caregiver as explained in the present verse. All invisible and visible assets that individuals possess and use to improve situations can be called as resources. Economic hardship and limited financial resources are associated with caregiver burden. Lower financial resources are related to higher burden and poorer caregiver well-being. Caregiving often leads to additional costs such as medical expenses and lost wages. Perceived financial strain had a stronger relationship with depressive symptoms and anxiety among caregivers.[33] Hence physician should assess the status of financial condition of the concerned patient by observing '*doota*'.

'Sprushannangaani baalaamshcha -- pratyaakhyeya stathavidha' (Verse 4 & 5)[3]

If a messenger (*doota*) displays behaviours such as touching his own body parts (*sprushan angaani*), touching or pulling the hair on his head (*baalaamshcha*), and covering up his own navel with hands (*pidhaaya paaninaam nabhim*) during the interaction with physician, he (such type of a messenger) should be avoided (*pratyaakhyeya stathavidha*) or physician should avoid home visit to the concerned housebound patient (care recipient or patient) (*aaturasya yadaa doota*). '*Sprushan angaani*', '*sprushan baalaamshcha*', and '*pidhaaya paaninaam nabhim*' denotes various motor stereotypies. Stereotypic movements are involuntary, repetitive, bizarre, rhythmic, patterned, coordinated, predictable, and purposeless. Various other terms used synonymously for motor stereotypies are abnormal repetitive behaviours, circumscribed interest patterns, preoccupations, abnormal object attachments, unusual sensory responses, and social communication difficulties. Trichotillomania (*sprushanti baalaamshcha*), body rocking, self biting, and skin picking (*sprushanti angaani*) comes under the category of 'body-focused behaviours' (*sprushanti angaani*). Motor stereotypies includes various abnormal movements such as head nodding and banging, finger wiggling or writhing or drumming, body rocking, nail biting, tapping one's feet or pencils, hair twirling (*sprushanti baalaamshcha*), bilateral flapping or rotating the hands, fluttering fingers in front of the face, flapping/waving arm and hand movements, mouth opening, neck stretching or extension, vocalization/involuntary noises, hair twisting (*sprushanti baalaamshcha*), thumb sucking, lip biting, self biting, touching one's face (*sprushanti angaani*), playing with hair (*sprushanti baalaamshcha*), pens, or jewelry, scratching head (*sprushanti baalaamshcha* ?), hand shaking, posturing (*pidhaaya paaninaam nabhim*), opening and closing of the hands, flexion and extension of the wrists, leg shaking or kicking, covering ears, and facial grimacing. Motor stereotypies are associated with periods of engrossment, excitement, stress, fatigue and boredom and they may

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also be time consuming or disruptive. [34] The quality of care provided by caregiver may get compromised or adversely affected due to the motor stereotypies and finally it may hasten care recipient's mortality.

'Kapaalikaam sharkaraam -- pratyaakhyeya stathavidha' (Verse 6)[3]

If a messenger is involved in activities such as breaking a potsherd (*kapaalikaam bhinatti*), stones (*sharkaraam*), and charcoal (*angaarikaam*) during the interaction with physician, he (such type of a messenger) should be avoided (*pratyaakhyeya stathavidha*) or physician should avoid home visit to the concerned housebound patient (care recipient or patient) (*aaturasya yadaa doota*). Items such as potsherd, stones and charcoal represent or denote poor financial status or economic condition or lack of tools and resources of patients and/or caregivers. Involving in activities such as breaking potsherds, stones and charcoal etc while talking to physician may also denotes caregiver's disinterest in conversation or caregiving process. Informal caregivers may encounter strains like incurring costs as a result of providing support to someone with a chronic health condition or disability. More than half of caregivers had a financial or health barrier.[35] Caregiving affects a caregiver's work and family financials. Caregiving expenses such as transportation, prescription and non-prescription medications, medical supplies, equipment, and homemaking supplies can also affect financial adequacy. It has been established that caregivers providing care to patients who were reported to have more health problems or illnesses also reported a higher level of caregiving burden. Financial costs are the most important predictors of caregiving burden. Caregivers providing care to patients with a lower level of financial adequacy have reported a higher level of caregiving burden. The relationship between financial costs of caregiving and caregiving burden of the family caregivers has been well established.[36] Physician can assess the poor financial condition or lack of resources of caregiver (using objects such as charcoal, potsherd and stones) and also economic impacts on caregiving processes.

'Aaste bhumau parishraantau -- pratyaakhyeya stathavidha' (Verse 7)[3]

If a messenger fall to the ground (*aaste bhumau gruhnaati*) with severe fatigue (*parishraanta*) or fainting (*bhrama*) during the interaction with physician, he (such type of a messenger) should be avoided (*pratyaakhyeya stathavidha*) or physician should avoid home visit to the concerned housebound patient (care recipient or patient) (*aaturasya yadaa doota*). Fainting, swooning, and syncope (*bhumau gruhnaati bhraman*) can be problematic. Syncope is a condition of fainting/blacking out (*bhrama*) with a sudden and transient loss of consciousness caused by insufficient oxygen delivery to the brain (via hypotension or other mechanisms). The term fainting is less intimidating. In presyncope or near-syncope, an individual can remember manifestations (eg, dizziness, blurred vision, weakness - *parishraanta*, the fall - *aaste bhumau gruhnaati*). Its signs and symptoms include pallor, nausea, rapid breathing and weakness (particularly of the limbs, leading most individuals to sit down) (*gruhnaati angamatha bhraman*). Transient loss of consciousness is usually associated with loss of postural tone (*bhumau gruhnaati bhraman*). Causes of transient loss of consciousness can be divided into 4 major categories: neurocardiogenic, orthostatic hypotension, cardiovascular and neurogenic. "Going to ground" (*bhumau gruhnaati*) utilizes decreased gravitational demands on blood flow to quickly restore oxygen return to the CNS, and both sympathetic and parasympathetic responses return to normal quickly.[37] Caregiving can also be daunting, physically and emotionally challenging, and isolating. Caregiving results in caregiver burden. The physical well-being of caregivers is often compromised because caregiving and involves great levels of physical effort. Caregivers often neglect their own routine health care needs, including health maintenance and treatment for their own health conditions.[22] Caregivers often suffer with chronic medical conditions, neglect their own health, and are less likely to adopt preventive health measures.[21] The caregiver or *doota* suffering with presyncope or fainting or severe fatigue due to various underlying medical conditions can't take proper care of his patient and also can't provide quality caregiving hence physician should avoid home visit of concerned patient.

'Nashtam mrutamatikraantam -- yadaa vadet dooto na so asti vai' (Verse 8)[3]

If a patient's messenger uses 'negative' words such as lost (*nashtam*), dead (*mrutam*) and bygone/surpassed/ passed away (*atikraantam*) etc while narrating the medical condition of the concerned patient to physician, expert physician should consider that the concerned patient is already dead. The present verse denotes that the physician should avoid home visit to the concerned patient, if his (patient's) *doota* (caregiver) had the negative mindset towards the patient. The present verse denotes caregiver burden or distress or poor physical & psychological health (especially depression), caregiver's negative attitudes, care recipient's poor health condition and greater dependency, and disrespectful behaviour of the caregiver all together may influence the caregiving process negatively and hasten the mortality of the patient. Disrespectful behaviour (which can be assessed by the caregiver's words such as lost, dead, futile, is of no use etc) impairs communication and collaboration, undermines staff morale, undercuts individual contributions to care, increases staff resignations and absenteeism, creates an unhealthy or hostile work environment, causes some to abandon their profession, and finally harms patients (*na so asti vai*). These behaviours have been linked to adverse events, medical errors, compromises in patient safety, and even patient mortality (*na so asti vai*). Disrespect causes the recipient to experience fear, anger, shame, confusion, uncertainty, isolation, self-doubt, depression, and various physical ailments (*na so asti vai*). Characteristics of the individual, such as insecurity, anxiety, depression, aggressiveness, narcissism, and a sense of inadequacy may leads to disrespectful behaviour.[38] Negative caregiving experience is likely to be affected by caregivers' characteristics. Caregivers who are having low level of education, working, and poor health tend to report more distress. Caregivers are likely to experience a higher level of distress when care recipients exhibit more problem behaviours (*na so asti vai*) or show greater dependency, when caregivers spend long hours helping with ADL or IADL, or when they do not receive reciprocal help or positive feedback from care recipients. Lack of someone to take over caregiving tasks, lack of support from friends & relatives and family conflicts are positively related to caregivers' depression (which can be assessed by the caregiver's words such as lost, dead, futile and waste of time). Care recipients' problem behaviour is related to negative caregiving experiences for all caregivers.[39] By observing the negative mind set of the caregiver, physician can estimate the prognosis of the concerned patient.

'Karam karena gruhnaati -- pratyaakhyeya stathavidha' (Verse 9 & 10)[3]

If a *doota* or caregiver displays behaviours such as holding one hand with other (*karam karena gruhnaati*), strokes his hand with his palm (*paanina taadayet karam*), lip biting (*khaadet oshthau*), tongue biting (*khaadet jihwaam*) and NB (*nakhaan dantaishcha kalpayet*) during interaction with physician, he (such type of a messenger)

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should be avoided (*pratyaakhyeya stathavidha*) or physician should avoid home visit to the concerned housebound patient (*aaturasya yadaa doota*). The present verse denotes various motor stereotypies or 'body-focused behaviours' such as finger wiggling or writhing (*karam karena gruhnaati*?) or drumming (*paanina taadayet karam*?), NB (*nakhaan dantaishcha kalpayet*), bilateral flapping or rotating the hands, fluttering fingers in front of the face, flapping or waving arm and hand movements (*karam karena gruhnaati*?), lip biting (*khaadet oshthau*), self biting (*khaadet jihwaam*?), hand shaking, closing and opening of the hands and extension and flexion of the wrists (*paanina taadayet karam*?).[34] The quality of care provided by caregiver may get compromised or adversely affected due to these motor stereotypies and finally it may hasten concerned patients mortality (*pratyaakhyeya stathavidha*). Hence physician's home visit to such type of house bound patient (who is having sick caregiver suffering with motor stereotypies) would be of no use as explained in the present verse (9 & 10) and also previous verses (1, 4 & 5).

'Aaturasya yadaa gruhe -- pratyaakhyeya stathavidha' (Verse 11)[3]

Physician communicating with the patient during home visit (*aaturasya gruhe*) hears negative words such as 'cutting' (*chhidyate*) or 'breaking' (*bhidyate*) in patient's house, that patient won't survive for long or will die soon (*pratyaakhyeya stathavidha*). Negative words at patient's home such as 'broken' or 'cut' etc denotes negligence or improper handling of the utensils or objects (may denote lack of skill or patience or aggressiveness or conflicts or frustration in family members or caregivers), hostile environment, poverty, family caregiver burden or distress (may be due to patient's illness), and disinterest in caregiving (may be due to chronic medical illness and poor prognosis of the patient's medical condition). Physician should assess these negative caregiving attitudes among family caregivers or family members during home visit and avoid treating concerned patient (as there is no hope of recovery due to negative caregiving attitudes among family caregivers). Informal caregivers, typically family members or friends, provide care to patients with a variety of conditions such as advanced age, dementia, and cancer. This caregiving experience is commonly considered as a chronic stressor, and caregivers often experience negative psychological, behavioural, and physiological effects on their health and daily lives (can be assessed by the usage of negative words such as cut or break etc). Caregiving stress is characterized by anxiety, depression, worry, loneliness, higher levels of emotional distress, fatigue, sleep impairment and unhealthy behaviours (using words such as *chhidyate* & *bhidyate*).[40]

'Paraavartya ghatam purnam -- rogino yasya naasti sa' (Verse 12 & 13)[3]

When a patient's messenger (*aaturasya yadaa doota*) enquires the physician after turning back from a pot full of water (*paraavartya ghatam purnam*) and a sacred person (*Brahmin*) (pot full of water and facing a *Brahmin* both are considered as good omens and turning away from them or emptying the full vessel are considered as bad omens), he (concerned patient and his messenger) should be repulsed or avoided (*pratyaakhyeya stathavidha*). Going away or turning away or moving in opposite direction to a *Brahmin* is considered as bad omen and it may denote concerned patient's death or worsening of a condition (*pratyaakhyeya stathavidha*). Emptying the pot (having full of water) and turning away from it is also considered as bad omen. If a vulture (*grudhra*), a fox (*srugaala*), a crow (*kaaka*) or an owl (*ulooka*) and a raven (*vaayasa*) (all are bad omens) are making noise on the right side (*dakshino parshwe*) of the patient (*rogino*), he (patient) is as good as dead (will die soon) (*yasya naasti sa*). In the present verse '*Maharshi Bhela*' has described bad omens and their negative effects on patient's prognosis. Various auspicious and inauspicious signs are explained in classical *Ayurvedic* texts and they can only be understood with the help of '*Jyotishya shastra*' (astrology). '*Jyotishya'* recognizes the influence of planets on human life and destiny of human beings. The word '*Shankuna'* denotes a bird and signs related to birds are called as '*Shakunas'*. The word '*Nimitta'* denotes 'reason' or '*karma'* (consequences of past deeds). The omens can be classified as good or bad according to '*Shakuna shastra*' and based on which predictions can be made. Whenever physician finds these omens (good or bad) in his clinical practice, he should keep his patient under careful observation for long time to check for any untoward incidents.[16]

The crow (*kaaka*) has been used as a sign of evil and death for thousands of years. Ancient folk tales claim that crows can smell death through the walls of a house, and a crow flying into or perching on top of a house (*nadeyu dakshino*?) indicates that someone living there will soon die (*rognio yasya naasti sa*). Crows and ravens are both scavengers and will indiscriminately pick at road kill, corpses on battlefields, or even other dead crows. Crow and other scavengers may be drawn as the figureheads for terrible events, because of their tendency to visit the last earthly resting place of dead animals and feed on them.[41] Crows (*kaaka*) along with other corvids (*vaayasa*) have provided strong evidence for advanced cognitive abilities. New research indicates that crows are capable of matching stimuli on the basis of analogical relations (i.e., similarity of size, colour and shape).[42] Corvus brachyrhynchos (American crow) (*kaaka* or *vaayasa*), quickly and accurately learns to recognize the face of a dangerous person. Birds like crows can recognize people and hold a grudge. Corvids are cognitively advanced, capable of individual and social learning, and have the ability to recognize specific humans. Crows can adjust their behaviour relative to specific people at particular places by scolding and mobbing, or remaining distant from potentially dangerous people.[43] Physician should be alert to find out these bad omens during home visits.

'Kashaya vastro mundo vaa -- na doota samprashasyate' (Verse 14 & 15)[3]

A messenger who wears a reddish brown garments (*kashaya vastra*) or leather straps (*charmabhi parivrutto*) or petticoat (*shaatika*) or is clean shaven head (*munda*) is naked (*nagnaka*) or who is a cook (*mahanasya*) or who is anointed with oil (*tailaabhyakta*) or has a cut off nose (*chinna nasa*), or a babbler/psychotic (*vaagmi*) or has cleft lip (*bhagnaushta*) or is himself crippled (*kharavaato*) - such a messenger (*doota*) is inauspicious (*na samprashasyate*) and should be repulsed or avoided (physician should not treat concerned patient). '*Maharshi Bhela*' in the present verse has assessed the prognosis of concerned patient based on the external appearance or looks of a caregiver / *doota* and also the impact of the cultural or ethnic or religious diversity (between caregiver and care recipeint) on caregiving.

Kashaya vastra, munda, charmabhi parivrutto, shaatika & jatila:

Wearing reddish brown garments (*kashaya vastra*) and having cleanly shaved head (*munda*) (Buddhist clothing?) or having matted hair (*jatila*) (Hinduism? or Sage?) or naked (*nagnata*) (Jainism?) or *charmabhi parivruttio* (wearing leather straps or animal skin) or *shaatika* (wearing petticoat) denotes religious dressing or clothing or symbolism of a caregiver/*doota*. If the caregiver's cultural or religious

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back ground is different from that of care recipient's (patient), conflicts may arise and it may impact caregiving process adversely. Caregivers need to be culturally competent and they should understand that differences exist among cultures and individuals have different needs. Cultural incompetency impacts on care outcome, and so do cultural difference of caregiver and patient. This could be detrimental to caregiving and wellbeing of the patient. Cultural differences surfaces as result of care recipient and caregiver not sharing same cultural background. Language and communication issues, cultural incompetence skills, health and religious belief, and awareness issues are challenges that could impact on caregiving. Negative relations that exist among caregivers and patients in most cases are linked to lack of awareness, cultural misunderstandings and linguistic issues.[44] *Kashaya vastra, mundita* and *jatila kesha* etc clothing or appearance of a caregiver may represent cultural or religious related inter personal conflicts between the caregivers and their patients that may impact caregiving adversely and it may also denotes that caregiver is immersed in his religious or spiritual practices and neglects the patient or caregiving.

Nagnaka, vaagmi & unmatta:

Caregivers roaming naked (*nagnaka*), talking excessively or irrelevantly (*vaagmi*) and behaving inappropriately (*unmatta*) are considered inauspicious. Roaming naked may denote various conditions like BPSD, FTD, dementia, hebephrenia, mood disorder with psychosis[45] or a particular religion (Jainism?). Excessive or irrelevant speech (*vaagmi*) may denote psychopathological conditions such as mania (pressure of speech),[46,47] or dementia especially FTD.[48] The word '*unmatta'* (or *unmada*) denotes psychotic conditions such as schizophrenia or mood disorder with psychosis or dementia etc.[49-51] Psychopathology in caregiver denotes caregiver burden or distress (secondary). Caregivers who provide care to a chronically ill family member are potentially at risk for caregiver burden and declining mental health. Caregiver burden and distress are consequences of caregiving, which leads to psychiatric morbidity. Sleep disturbances and depressive symptoms are common in caregivers.[52] Caregiver may experience effects such as psychological distress, impaired health habits, psychiatric illness, physical illness, and even death. Caregivers first experience distress and depression that ultimately lead to illness and possibly to death.[53] The caregiver displaying features like '*nagnaka'*, '*vaagmi'* and '*unmatta'* is not suitable or competent of taking care of a patient (due to underlying psychopathology) and hence physician should avoid the concerned patients of such caregivers (who have been suffering with psychiatric conditions).

Chinna nasa:

The laws in various countries established amputation of the nose (*chinna nasa*) in ancient times, as corporal punishment, for misdeeds such as adultery, taking advantage of his position, or unfaithfulness. This was a fairly widespread punishment, particularly in India, indeed the Indian method of plastic reconstruction of the nose dates back a very long time.[54] The caregiver who is coming with '*chinna nasa*' (cut off nose) might have done misdeeds or adultery or some other illegal activities in the past and got punishment for the same (amputation of the nose), hence they are not suitable for (may be due to their faithlessness or disloyalty) caregiving jobs.

Mahanasee:

A professional chef (*mahanasee*) is not suitable for caregiving job according to '*Maharshi Bhela*'. A professional chef or cook may not get sufficient time to take care of a patient (due to his profession or employment) or may neglect the patient while providing care. Caregiving responsibilities frequently interferes with employment, forcing a reduction in hours worked, refusal of promotions, change in work schedules and the need for a leave of absence. It has been found that longer hours providing assistance are associated with reduced caregiver employment.[55] Caregiver burden can lead to loss of income and benefits, job security and career opportunities. The present verse denotes 'impacts of caregiving burden on caregiver's employment' or 'impacts of employment of the caregiver on caregiving abilities'.

Tailaabhyakta, bhagnaushta & kharavaata:

The word '*tailabhyakta'* denotes the person (caregiver) who had applied oil all over the body (may be as part of the treatment). Application of oil or undergoing oil massage denotes that the person (caregiver) might be suffering with some physical illness (neurological or musculoskeletal) and hence he (caregiver) might not be competent in providing quality care to the patient (caregiving may get affected due to the physical illness of a caregiver). Quality of caregiving may get affected due to the physical illness of a caregiver. Lower immunity, poorer health, and impaired functional health have been observed among caregivers. Factors affecting caregiver physical health include muscle strain and musculoskeletal injury from caregiving activities, and neglect of personal health (i.e., diet and physical exercise). Half of caregivers report living with at least one chronic condition, and also report that their declining health affects their caregiving abilities.[56] The word '*bhagnaushta'* denotes 'cleft lip'. Oral-facial clefts, such as cleft lip and palate, are birth defects in which the tissues of the mouth or lip don't form properly, resulting in speech characterized by a resonance disorder, articulatory or phonological disorder, swallowing and hearing problems.[29] The caregiver who has cleft lip may not communicate properly with the physician and care recipient (patient) and it (cleft lip deformity) may affects their (caregivers) caregiving abilities. The word '*kharavaata'* denotes a caregiver who has been crippled [4] or deformed or suffering with a neurological or musculoskeletal condition or any other chronic disabling condition. *Kharavaata* condition of the caregiver may denotes caregiving burden and its impact on the physical health of the caregiver or caregivers physical illness or deformity which makes him (caregiver) incompetent in providing quality care to care recipient or patient. The present verses (14&15) denotes various factors related to a caregiver such as religious, cultural, economic, employment, and physical & mental health and their impact on caregiving abilities.

'Iti doota samaachaaro -- sa vai bhishak' (Verse 16)[3]

The physician who is skilful and wants to get success in his endeavours should assess or analyze all those factors as explained in this chapter regarding *doota*. A wise physician can assess the prognosis of concerned patient by properly assessing his (patient's) *doota*.

Conclusion

The word '*doota'* denotes either messenger or caregiver or both. Allotting a special chapter for the description of *doota* (*doota adhyaya*) is the unique contribution of '*Maharshi Bhela*' to *Ayurveda*. This chapter consists 16 verses narrating the phenotypic characteristics of a caregiver and their influences on caregiving and care recipient. This chapter has laid the foundations for various concepts such as the science of caregiver health, science of caregiving, caregiver burden and distress, caregiver roles & impacts, caregiver-receiver mutuality, religious & cultural diversity between caregiver and receiver and its

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impact on caregiving, and impact of caregiver characteristics/factors (such as physical & mental health, economic & employment status, personality traits, dressing style, speech & communication abilities, behaviour and skill etc) on caregiving and on care recipient. The complex interrelationships between the caregiver, care recipient (patient) and physician have been cited in this chapter. Caregiving burden can have a significant negative impact on the mental and physical health of informal or family caregivers, and that poor health status (of caregivers) can translate to negative health outcomes in the care recipient/patient. Various factors impacting the caregiving process and their role in the prognosis of care recipient's condition (especially at EOL stages) have been conceptualized and documented by accurately by '*Maharshi Bhela*' thousands of years ago. Further studies are required to substantiate the findings of present work.

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Conflicts of interest

None.

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