Supplementary material C. Summary of Thematic Analysis and Direct Content Analysis

Themes	**Examples**	**Categories**	**Examples**
Characterisation of MD	Violation of individual's core morals and obligations 1. Threat to an individual's moral integrity 2. Inability to fulfil moral obligations to patients, families, and the public Being pressurised to pursue a course of action that is believed to be unethical. 1. Complicity in wrongdoing 2. Wrongdoing associated with an organization's professional values and practices	**Innate ring**	Factors that affect MD ○ Religion and Spirituality ○ Female gender ○ Age ○ Personal characteristics (e.g. lack of knowledge and assertiveness, perceived lack of autonomy or professional authority, and self-doubt) Role of humanity in MD ○ Being human causes factors such as personal feelings to interfere with

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	3. Uncertainty regarding morals but forced to decide Witnessing a course of action that is believed to be unethical 1. Patient does not receive what is morally judged to be the best treatment 2. Conflict between individual conscience and decisions or actions occurring in their environment Being prevented from pursuing a course of action that is believed to be ethically correct 1. Being unable to pursue a course of action that is believed to be ethically correct due to perceived constraints		one's ability to be objective, and this can cause MD ○ Conflict between moral intuition and innate biases in our nature can result in MD ○ Assessment of a patient's bests interests is subjective, thus forming different beliefs. ○ Acting against informed moral judgment creates a conflict of conscience by abandoning/ compromising, consciously or unconsciously, convictions (including religiosity), ethical values or norms, and/or personal integrity, thereby resulting in MD

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	2. Being unable to pursue a course of action that is believed to be ethically correct due to perceived institutional or regulatory constraints 3. Being unable to pursue a course of action that is believed to be ethically correct due to perceived personal constraints 4. Being unable to pursue a course of action that is believed to be ethically correct due to perceived interpersonal constraints 5. Having limited power to change situation 6. Attempted actions fail to achieve the desired morally acceptable outcome Differences in intensity of MD between physicians and nurses		

	1. Nurses have higher levels of MD than physicians 2. A few studies mentioned that nurses faced lower levels or no difference in MD Differences in causes of MD between physicians and nurses 1. Both physicians and nurses were concerned with decision making 2. Physicians were more concerned with lack of resources, quality of care, dilemmas or ethical confrontations 3. Nurses were found to be more affected by perceived lack of power and have a poorer perception of ethical climate as compared to physicians		

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	Differences in ways of coping between physicians and other healthcare workers 1. Physicians have been found to cope with MD better than nurses 2. Physicians were less likely to engage in constructive behaviors (venting, mentoring networks, and building team cohesion) than are nurses or ancillary staff		
Causes of MD	Individual level 1. Powerlessness 2. Doubt in personal abilities 3. Concerns about personal health 4. Concerns about institutional resources and roles 5. Decision-making against one's beliefs	**Individual ring**	Individual Characteristics Associated with MD • Personality traits, coping mechanisms, past experiences and concurrent stressors

	Patient level 1. Issues with patient care a. Patient is receiving aggressive or futile care that the physician believes may have no benefit or even harm the patient. b. Patient is not receiving or being denied care that the physician believes would be beneficial. c. Withdrawal of life-sustaining treatment that the physician believes may prematurely end the patient's life.		• Those who are less certain about what is "right" may have less related MD Beliefs and perceptions affected in MD • Perceived violation of values, threatening of moral integrity • Perception of futility of care/ more life-sustaining treatment than the physician believes is appropriate • Disconnect between perceived ethical practice and delivered clinical practice • Perception that care does not respect patient's dignity and autonomy

	d. Administration of interventions that the physician believes may prematurely end the patient's life. e. Being unable to achieve professional standards of care f. Lack of consistency or continuity of care g. Personal biases against patients which may interfere with the quality of care provided to patients h. Lack of respect for patients and patient autonomy i. Involvement in a medical error j. Physician has to lie to secure resources or care for the patient		• Treating patients whose plan of care was poorly defined • Having to work with limited levels of staffing which one considered unsafe • Incongruence between personal values and values of their organisation/ institutional constraints Internal conflicts and personal doubts causing MD • Being given more responsibility and freedom than they felt they were qualified to handle

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	k. Inequality between patients in terms of the care they receive l. Patient is 'irresponsible' (e.g. continues to maintain a lifestyle detrimental to health) 2. Issues with patient communication a. Deceiving or withholding full information about their medical condition(s) from patients b. Provision of inadequate information to the patient or family c. Providing false hope to patients and families d. Inadequate informed consent for medical decisions		• Conflict between personal beliefs and desires of the patient/ patient's family/ surrogate decision-maker • Dilemmas surrounding observed ethical misconduct/ unethical behaviour by colleagues • Dilemmas regarding prioritisation and resource allocation • Conflict between spending extensive resources and patient care • Conflict between individual desire to care for patients and limitations based on public policy guidelines • Common clinical dilemmas e.g. balancing a duty to minimize patient harm (nonmaleficence) while

	e. Poor communication giving rise to differences in understanding between physician and patient or family 3. Mismatch between and physician's and patient's/family's goals of care a. Family requests the provision of aggressive or futile care that the physician believes may have no benefit or even harm the patient. b. Family goals differ from physician's goals (e.g. preservation of life vs quality of life) c. Conflict with family regarding patient's care		facilitating patient autonomy, honouring advance care preferences including decisions to resuscitate or not, or withholding or withdrawing of life-sustaining treatments Impact of MD on the individual • Impact on personal Wellbeing • Psychological Health (e.g. Depression, Post-Traumatic Stress Disorder) • Emotional Consequences (e.g. Burnout and emotional exhaustion, Frustration, anger, sadness, guilt, fear, defeat, demoralization)

	d. Disagreement with patient regarding care plan e. Unrealistic patient or family expectations and demands f. MD arises due to attempted shared decision making 4. Caring for vulnerable patients a. Patient or family is unable to afford care b. Patient is vulnerable or unable to express his/her wishes c. Uncertainty about the patient's capacity to make or change decisions d. Family is unable to provide adequate care for patient		• Moral Consequences (e.g. Moral outrage, feeling that core values had been violated, Moral residue/ persistent doubt and distress, Moral desensitization) • Cognitive Consequences (e.g. Distractedness, cognitive errors) • Physical Health (e.g. Physical toll, exhaustion) • Powerlessness, self-blame, sense of personal failure • Compassion fatigue • Work-related impacts

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	5. Interacting with abusive patients and families a. Patient is rude or abusive b. Abusive family members c. Patient is 'exploitative' (e.g. abuses resources such as government aid) 6. Being involved in patient and family suffering a. Witnessing patient's pain and suffering b. Family unpreparedness to face patient's death c. Family suffers as they watch the patient suffer		• Intention to quit • increase in errors and adverse events • Hypervigilant, more focused and attentive towards patients, feeling the need to advocate for them • Motivation to work to improve the system of care Coping strategies employed by individuals to manage MD • Compartmentalization of emotions, leaving concerns at work to prevent them from affecting personal life

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	d. Unexpected death of a healthy young person e. Treating a patient may harm the wellbeing and finances of his/her family 7. Being involved in legal issues a. Disclosure of patient information against the patient's wishes b. Giving in to family's wishes due to fear of a lawsuit Institutional/hospital/team level 1. Resource constraints a. Human resource, b. Materials, c. Time		• Conscious effort to separate emotional responses from the clinical encounter • Coping through thoroughness – evaluating rational arguments, engaging in formal deliberation, utilising protocols, care pathways • More likely to find support from outside of the institution (e.g. spending time with family, exercising, alcohol) • Both self-constructive (e.g. exercise), and self-destructive (e.g. alcohol) • Mindfulness and self-care practices (e.g. physical activity, mindful

	2. Administrative deficiencies a. Lack of administrative support, b. Inadequate training, c. Poor continuity of care, d. Lacking appropriate medical knowledge, e. Collusion 3. Organizational structure a. Disagreement with policies b. Disagreements with teammate, c. Distrust within team, d. Poor ethical climate, e. Poor teamwork, f. Hierarchical issues, g. Ineffective/restrictive policies,		focusing, meditation, breathing exercises, and positive interactions with friends) • Maintaining emotional neutrality • Deliberate and thoughtful introspection with support, including consultation with third parties • Developing moral resilience • Less frequently, by positive reframing and humour • Opting to no longer be involved in that case • Junior doctors may cope by granting autonomy to their superiors, but

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	h. Poor role-modelling from superiors 4. Societal causes a. Feelings of being unappreciated by others, b. Fear of being sued by patient, c. Insurance pressure, Unjust distribution of healthcare, etc)		develop a different coping style later in their career • Most dealt with MD inwardly or did not deal with it at all
Influences of MD	Risk factors 1. Personal characteristics a. Females gender b. Fewer years of experience c. Personality traits such as sympathy, lack of assertiveness, poor self-esteem, or lack of flexibility	**Relational ring**	A dilemma between choosing to serve the patient and risking infection or not serving the patient to protect own family Impact on relationships with loved ones • Disruptions in relationship with family/closed ones (e.g marital conflict, family disruption, divorce)

	d. Poor physician well-being due to psychological strains and stressor e. Lack of social support 2. Workplace factors a. Irregular working hours/ night shifts b. Negative work environment (negative ethical climate, stressful work environment, lack of a collaborative team, an environment where profit is prioritised over patient care) c. Lack of provider continuity d. Lack of good leadership to handle morally distressing situations		• Difficulty in balancing professional and family roles; inadequate work-life balance • Feeling of isolation from family, friends, and colleagues Interventions aimed at improving relationships • Effective coping and resilience can be nurtured through relational activities with colleagues, employers, and friends (e.g. peer support, positive interactions) • Informal debriefing with a trusted colleague or mentor after a death or

	e. Being involved in the direct care of patients 3. Certain specialisations such as emergency medicine, oncology, adult medicine, adult, paediatric and neonatal intensive care 4. Societal factors a. A deficient health care system b. Lack of proper legislation leading to low government expenditure on health care 5. Disasters or emergencies a. Unfair allocation of scare resources b. Increase in the number of distress-provoking situations		traumatic experience to mitigate personal emotional recovery • Interactions with children • Creating environments that allow acknowledgement of MD by clinical and educational leaders • Encouraging research of the psychological impact of MD on family, personal relationships and social life

	c. Sub-standard care due to resource scarcity d. Experience of secondary or vicarious trauma e. End of life care Protective factors 1. Certain personal characteristics including a. Older age b. Being married or partnered c. Having good values d. Being able to maintain a state of emotional neutrality and/or positive orientation e. Being psychologically empowered f. Being more skillful or experienced		

	g. Being better communicators h. Holding a power position in medical hierarchy 2. Factors related to patient care a. Caring for patients who reside in nursing homes, have advance care planning or older aged patients b. Having emotional connections with patients c. Working as a pediatrician 3. Team factors a. Open communication within the team b. Sharing knowledge and skills amongst colleagues in the same healthcare team		

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	c. Effective teamwork where discussion about patient care plan is encouraged and practiced d. Good team dynamics which includes good interpersonal relationships 4. Institutional factors a. Training physicians with ethics b. Conducive and supportive work environment c. Allowing physicians to have more autonomy and control d. Promotion of person's ability to practice his or her faith Changes with time		

	1. Build-up of MD over time with repeated exposures that result in a moral residue and is described as the crescendo effect 2. MD would gradually de- crease or even disappear over time with more experience and by having more authority or autonomy 3. Chronic, unmitigated, or repeated experiences of MD often generate an ongoing sense of deficiency		
Impact of MD	Negative impacts to self 1. Development of negative emotions (frustration, anger, guilt, sadness, depression, demoralised, defeated) 2. Feeling isolated, distant or lonely	**Societal ring**	Resource constraints and rationing limiting adequate patient care • Insufficient resources (e.g. staff, PPE, ventilators, money)

	3. Becoming desensitised (depersonalised, indifferent, apathetic) 4. Low sense of personal accomplishment (feelings of inadequacy, loss of self-worth, self-doubt, decreased self-esteem, powerlessness, worthlessness, disempowerment) 5. Development of individual coping mechanisms in response to emotions experienced 6. Quitting of job, or having an intention/consideration to 7. Being absent from work 8. Regretting to do medicine		• Unfair, unacceptable and lack of explicit criteria on resource allocation Institutional rules and policies leading to MD • Institutional constraints prevent physicians from doing what they think is right for the patient • Organisational pressures e.g. in cost reduction • Lack of guidance (institutional/legislative) for decision making

	9. Loss of capacity to evaluate clinical and ethical situations; impaired decision-making ability 10. Becoming distracted, unfocused 11. Increased levels or risk of burnout from physical and emotional stress 12. Increased dissatisfaction with work or quality of care provided 13. Physical, emotional and compassion fatigue and exhaustion 14. Loss of professional, personal or moral integrity 15. Loss of professional or moral identity Negative impacts to patients and families 1. Reduced quality of care		• Not giving standard of care due to non-medical factors like citizenship, ability to pay • Not giving standard of care due to reluctance advocating the interests of their patients for fear of discord with the parental prerogative or institutional constraints • Resort to untruthful methods (e.g. lying about lab values) to get patient the care they need Victims of medical hierarchy • Inability to question decisions of superior even though decisions

	2. Reduced patient safety (increased medical errors, unsafe healthcare) 3. Provision of inappropriate treatments 4. Worse patient outcomes (increasing length of stay, increased pain levels, reduced patient satisfaction) 5. Destructive emotional responses towards patients (Emotional detachment, decreased empathy, cynicism, dehumanization, depersonalization, anger, frustration) 6. Decreased compassion, courtesy, respect to patient 7. Avoidance and abandonment of patients (physical, emotional and spiritual) 8. Inadequate attention to patients		seem contrary to what physician believed was right • Each step up the hierarchy of patient care will feel less MD as they're further removed from the patient Workload overload • Time constraints and having too much paperwork • Lacking work life balance • Increased work stress Poor working environment • Poor institutional culture/ethical climate

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	9. Withdrawal from patient care (Conscience objection) 10. Refusal to provide care 11. Worsen physician-patient relationship (impression of physicians being uncaring, damaged trust, mismatch between patient expectations and care provided) Negative impacts to healthcare team, institution and system 1. Poor relationships with colleagues, expression of frustration bitterness, anger and cynicism towards co-workers 2. Decrease department and unit morale		• Poor team dynamics with team member's ethical misconduct • Poor team collaboration Poor communication with colleagues and patients causing MD • Inadequate communication between clinicians and families • Poor communication in team • Compromising on informed consent e.g. lacking disclosure of salient facts and prognosis • Providing false hope/dishonest communication • Consent for autopsy as cause of MD

	3. Increased dropout rates of staff, difficulty in staff retention, increased cost of training new staff 4. Threatening integrity of healthcare providers and systems Positive impacts 1. Aids in identifying ethical issues 2. Positive impact on patient care (Indicator of conflicting opinions on patient care, Indication of inappropriate care for patients, Important for decision making processes, Re-evaluation to improve medical care plans) 3. Encourage Institutional level changes (Increased discussion about issues,		Providing suboptimal patient care • Difficulties in decision making (e.g. having to make the choice between life and death) • Conflicting opinions about care • Multiple competing interests (e.g. Doctors felt they had to work under multiple pressures—from patients, family) • Causing unintended harm (e.g. inflicting physical trauma on patients in process of resuscitation/care) • Patient bleeding while on anticoagulants a/w MD

	Reflection on institutional climate, Team reflection, Advocating for implementation of new policies) 4. Encourage individual reflection and self-improvement		• Children surviving with serious disabilities • expectations, legal obligations and their own ethical values) • Lack of provider continuity Experiencing sexual assault Effect on working ability of physician and functioning of the workplace • Reduced staff capacity • Reduced ability to provide care for patients • Burnout • Question purpose of job

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			• Decreased self esteem and increased sense of failure • Apprehension when interacting with patient/patient family • Cognitive errors/adverse safety events • Reduced workplace satisfaction Alleviating factors of MD • Patient gave prior clear preference about care • Good patient understanding about resource limitations • Physician participation in medical ethics courses • Increased physician experience

			• Increased interdisciplinary collaboration and professional autonomy Team- and institutional-level interventions to reduce MD • Reflection and discussion about event • Improvement of team camaraderie and shared values/support • Provide practical strategies for distributing caregiver burden • Individual self-care (e.g. hobbies, taking breaks, suppression or distraction)

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			• Acknowledging, anticipating, and focusing responses on areas causing MD • Standardising protocols for communication and decision making • Mitigating inequities by deliberate safeguards for the vulnerable • Approach to care provision that include both cultural and spiritual humility • Develop adequate infrastructure for sufficient care • Improving education on medical ethics and reduction of distress

			• Shift responsibility for rationing decisions to higher authorities • Adequate access to education in ethics and support • Peer support and use of experiential learning to enhance socialization, while exploring actual cases to foster ethical responsibility • Instituting End of Life training
Tools to assess MD	Direct measure of MD 1. MD Scale (MDS) and revised versions 2. MD Thermometer (MDT) 3. MD model (MDM) framework 4. Measure of MD for Healthcare Professionals	**Disharmony (Intra-ring conflict)**	Disconnect between moral intuition and latent biases Internal moral and ethical dilemmas (individual ring) ○ Conflict between concerns about patient's suffering and belief in

	5. Adapted from 2015 ACGME Milestones for Neurological Surgery Evaluation of the impact of MD 1. Revised MDS 2. Maslach Burnout Tool 3. Professional Quality of Life Scale Evaluation of the factors affecting MD 1. Revised MDS 2. C-Change Resident Survey Evaluation of the responses to MD 1. Batson's model and Eisenberg's elaboration		further measures to support recovery ○ Conflict between sanctity of life and sanctity of choice Conflict between physicians' perspectives and action (individual ring) ○ Having to perform interventions that one does not agree with ○ Conflict between desire to bend the rules for patients, and concern about personal integrity ○ Conflict between ethics in theory and ethics in practice ○ Value congruence between intrinsic values and practiced values

	2. Framework for addressing MD (Rushton et al., 2013a) 3. Framework for ethical decisions during MD (Martin, 2019) 4. Critical Incident Technique (Lievrouw et al., 2016) Qualitative frameworks (interview, open-end focus groups)		Inability to fulfil professional standards and obligations due to other factors within the societal ring (societal ring) ○ Conflicting professional roles – role of physician (provision of care) vs managerial role (gatekeeper of spending resources) ○ Professional standards and obligations vs resource limitations/ insufficient resources ○ Professional standards and obligations vs pressure from administrators or insurers to reduce costs

			○ Professional standards and obligations vs organisational culture and policies ○ Professional standards and obligations vs hierarchy/ differences in power dynamics between healthcare professionals ○ Professional standards and obligations vs pressure from patients' parents/ family ○ Conflict between time spent on administration and documentation, and time spent on direct patient care Balancing incongruent obligations and interests (societal ring)

			○ Conflict between obligation to the patient and obligation to society (in terms of resource allocation – futility vs distributive justice) ○ Conflict between legal requirement to report practices which may harm patients and organisational culture
Interventions to assess MD	Organizational interventions 1. Institutional Policies Create clear guidelines for patient care Allow physicians the choice to excuse themselves from situations they morally object Create appropriate channels for lodging concerns	**Dyssynchrony (Inter-ring conflict)**	Individual vs societal conflict in relation to patient care ○ Patient requests for care that goes against physician's moral beliefs about what is in the patient's best interest ○ Poor communication between physician and the patient, family or other team members leading to

	Protection of physicians from abuse Expansion of the responsibilities of hospital ethics committee 2. Team-based discussions and support Interdisciplinary team discussions for medical ethical decision making Team-wide debriefings and discussions about morally distressing situations Team building Sharing of workload among team members Ethics consultations, rounds and group discussions		differing perspectives on the right/moral course of action ○ Physician goes against patient's wishes because the physician believes the action is in the patient's best interest ○ Doubt about whether one's actions are morally correct because patient is unable to communicate ○ Physician witnesses the suffering of a patient but is unable to relieve the suffering ○ Physician has to tell a patient about a poor prognosis but is unable to offer many options

	Forums 3. Individual-focused interventions Psychological support and empowerment Mindfulness and resilience training Allocated time for self-reflection Burn-out related resources/toolkit for physicians Personal well-being management and professional satisfaction training Cognitive Processing Therapies Teaching Emotional Freedom Techniques Counselling		○ Family requests for aggressive care that may harm the patient and goes against physician's moral beliefs about what is in the patient's best interest. ○ Physician follows family's request due to fear of a lawsuit despite it going against his/her moral beliefs ○ Physician's moral obligation to provide care to the patient goes against the wellbeing of the patient's family Individual vs societal conflict in relation to intra-team dynamics

	MD consultation service 4. Education and research Education about the concept of MD Training on palliative care Ethics skills training Communication skills training Training on knowledge and skills for dealing with the pressures of hospital work Education on strategies for distributing the caregiver burden Education to prepare students for the challenges of the current institutional setting, with focus on junior doctors' individual identity		○ Team provides care that may harm the patient and goes against physician's moral beliefs about what is in the patient's best interest. ○ Team decides to limit or withdraw care which goes against physician's moral desire to preserve life ○ Physician has to compromise his/her morals in order to complete his/her work ○ Team decides to limit or withdraw care which goes against physician's moral desire to preserve life ○ Physician has to compromise his/her morals in order to complete his/her work

	Promote research to understand issues causing MD 5. Creating a conducive environment Create safe, supportive and well-organized environments Reduce hierarchy Individual coping mechanisms 1. Dissociation from distressing situation 2. Engage in self-destructive behaviour (excessive alcohol consumption, self-blame) 3. Engage in self-constructive practices (e.g. Mindfulness training/ Meditation, Healing rituals, Take care of basic needs, Exercise/ Yoga, etc)		○ Physician feels compelled to follow instructions without protest or to remain silent about moral concerns due to hierarchy ○ Physician is blamed for an adverse outcome despite acting morally ○ Physician witnesses colleagues providing inadequate or unethical care ○ Physician witnesses colleagues providing false hope or inadequate information ○ Physician keeps colleague's medical error a secret despite moral obligation to report it

	4. Emotional regulation (e.g. Crying, Ability to name the feeling, Down-regulate by pausing and taking deep breaths, etc) 5. Changing perspective of situation (e.g. Rationalization, Positive reframing, Seeing the bigger picture, etc) 6. Camaraderie and social support (Venting to colleague or friend, etc) 7. Relying on experiences over time to cope with MD (Self-realization over time) 8. Preventing MD 9. Involving patients and patient's families in treatment plans to prevent MD 10. Improved skills to handle MD 11. Help to deal with distressing situation		○ Physician witnesses diminished patient care due to poor team communication Individual vs societal conflict due to societal constraints ○ Physicians are unable to deliver the standard of care they wish to deliver due to institutional limitations ○ Physician is forced to take on the role of rationing resources due to limitations in resources ○ Physician is unable to act in accordance with his/her moral values due to institutional constraints

	Principles of interventions 1. Multi-level interventions at the individual, team and organizational levels are required to address MD 2. Empowerment of physicians (Encouragement of physicians to speak up)		○ Physician witnesses patient suffering due to a lack of provider continuity ○ Physician faces financial incentives to continue delivering care that goes against physician's moral beliefs about what is in the patient's best interest. ○ Physician is forced to care for patients he/she does not feel qualified to care for ○ Physician's legal obligations go against his/her own moral beliefs ○ Erosion of individual values/ethical integrity due to discordant values with the organisation

			Innate vs societal conflict ○ Team provides care that goes against the physician's religious beliefs Relational vs societal conflict ○ Tension between physicians' personal obligation to protect his/her own family and obligation to serve patients in need