Project Proposal

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Project Title	The Role of Emotional Granularity in Enhancing Resilience Among Young and Middle-Aged Colorectal Cancer Survivors: A Mixed-Methods Study
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Introduction

Colorectal cancer (CRC) is a type of cancer that develops in the human colon or rectum (Ratjen et al., 2018). According to the Global Cancer Observatory (GLOBOCAN) 2022, It is a significant public health concern worldwide (Bray et al., 2024). CRC is the third most commonly diagnosed cancer and the second leading cause of cancer-related deaths globally (Bray et al., 2024). In China, CRC incidence and mortality rates have been rising steadily, making it a critical area for intervention (Xia et al., 2022). The response rate to treatment for colorectal cancer has been improving along with the development of new anticancer drugs, and colorectal cancer can be cured with tumor resection and adjuvant chemotherapy, improving the 5-year survival rate (Santucci et al., 2020). However, with prolonged survival, CRC survivors will face more complex challenges due to the late effects of cancer treatment. Young and middle-aged patients face unique difficulties in adapting their lifestyles after cancer, and are at risk of higher levels of emotional problems (Medeiros et al., 2010; Tamura, 2021). In China, early-onset CRC prevalence is projected to rise from 170.99 to 237.29 per 100,000 between 2022 and 2050, despite stable mortality rates, underscoring a growing disease burden that demands targeted interventions to improve emotional health and quality of life (Li et al., 2025; Ong et al., 2025).

To be specific, young and middle-aged CRC patients (18 - 60 years) experienced higher occurrence rates for almost 50% of the symptoms due to their receipt of more intensive, shorter-cycle chemotherapy regimens, lower baseline functional status, and the emergence of unique chemotherapy-toxicity symptom clusters (Morse et al., 2024). Young and middle-aged cancer survivors (age < 60) with two or more comorbid conditions are more likely to have more and severe physical or emotional symptom (Jeon et al., 2019). In addition, compared to older patients, young and middle-aged patients are more likely to be exposed to complex social factors, such as financial stress and social isolation, following a cancer diagnosis. Specifically, the treatment of cancer will affect their work and thus cause severe economic toxicity (Alsakarneh et al., 2024; Ghazal et al., 2023); Social isolation is more common in young and middle-aged patients because cancer affects their careers and relationship (Fletcher et al., 2024; Khoo et al., 2022); For patients of childbearing age, the impact of cancer on their fertility is an even more specific negative factor in leading to a bad outcome (Baronas et al., 2024; Patel & Ahnen, 2018). Specifically for young and middle-aged CRC patients in China, studies have shown that they struggle to rebuild their social support networks and to access and screen

relevant health information, so that their health needs span the entire disease journey (Yajuan et al., 2024). In addition, CRC survivors frequently experience anxiety about treatment outcomes, future prognosis, and long-term survival, with emotional or psychological support and reassurance, information about managing illness and side effects, fear of cancer recurrence, and help with sexuality problems identified as their top unmet needs (Luo et al., 2024; Ng et al., 2019). Therefore, under such complex and numerous psychological and social challenges, resilience plays an important role in helping patients to cope well with the difficulties associated with cancer. Currently, few programs exist to enhance resilience in young and middle-aged colorectal cancer survivors after they finish primary treatment, even though they have distinct challenges. Developing tailored resilience-building interventions for this group will not only support their immediate well-being but also help them maintain better health as they age, thereby meeting their long-term medical and care needs.

Resilience is often described as an outcome, more specifically, an individual response to a difficult life-situation and a psychosocial outcome of growth, is crucial for CRC patients (Deshields et al., 2016; Southwick et al., 2014). Effectively managing emotions is a vital aspect of emotional well-being, and resilience underpins the ability of young and middle-aged CRC survivors to maintain their mental health and overall quality of life. According to the affect-regulation framework of psychological resilience, resilience has come from two major sources: the stress and coping approach and the emotion and emotion-regulation approach, guiding the development of most resilience-enhancing interventions (Compas et al., 2017; Lazarus, 2000; Troy et al., 2023). Within the transactional stress and coping framework, stressors that exceed individuals' coping capacities necessitate cognitive and behavioral adaptations to reestablish equilibrium. For those with low resilience, these adaptations require complex cognitive restructuring under high-stress conditions, which can impose undue psychological burden (Troy et al., 2023; Xiang et al., 2025). As mentioned, young and middle-aged colorectal cancer survivors already contend with significant psychosocial challenges, renders them particularly vulnerable to this burden. Consequently, mandating targeted cognitive or behavioral adaptations before resilience is bolstered may exacerbate distress rather than alleviate it. Yet emotions motivate cognition and behaviour, influencing adaptive or maladaptive pathways without being resistant and overburdened for patients with low resilience and high emotional burden (Barrett et al., 2007; Izard et al., 2002; Leichsenring, 2001).

Regarding the important role of adaptive and moderate emotion regulation in enhancing resilience. Existing emotional interventions have been developed to manage negative emotions

and improve resilience in cancer patients. A recent systematic review and network meta-analysis identified attention and interpretation therapy and positive psychology as effective emotional approaches for improving resilience (Ding et al., 2024). The two approaches enhance the resilience of cancer patients by, respectively, providing psychologically relevant positive coping strategies to help cancer patients better adapt to their environment (Cerezo et al., 2014), and diverting attention from cancer to avoid negative emotions (Lin et al., 2020). Following this review, a subsequent study developed the Managing Cancer and Living Meaningfully (CALM) intervention that incorporates emotional strategies. This intervention combines virtual reality (VR) technology to improve the resilience of breast cancer patients by providing guidance and emotional support for symptom management and facilitating emotional expression. However, these interventions provide patients with general strategies for emotion regulation, but do not focus on improving the patient's ability to effectively utilize these strategies, which is a key factor in effectively applying these emotional strategies to improve resilience (Kashdan et al., 2015).

Emotional granularity, or the ability to differentiate and label emotional experiences with precision, plays a crucial role in emotion regulation and resilience (Barrett, 2006; Tan et al., 2022). According to Barrett's Conceptual Act Theory (CAT), emotions are constructed through the integration of core affect and conceptual knowledge (Barrett, 2006). This allows individuals to recognize, differentiate, and interpret their emotional experiences, leading to more effective emotional responses (Gross, 2015). Previous study show that individuals with low emotional granularity exhibit reduced effectiveness of emotion regulation strategies, resulting in increased negative affect, whereas those with high differentiation manage emotional intensity more successfully and demonstrate greater psychological flexibility (Kalokerinos et al., 2019). This precision also fosters more effective emotional regulation, a key component of resilience in the face of adversity, by enabling patients to identify specific emotional experiences, which allows them to apply more targeted emotional strategies (Deshields et al., 2016; Erbas et al., 2022; Gross, 2015).

In summary, for young and middle-aged CRC patients, there are more key emotional and social factors challenges whether they arise from the disease, treatment outcomes, family responsibilities, career disruption or socialization. In this context, improving patient resilience can help them adapt to these stressors, maintain mental health, and recover from emotional setbacks. Although emotional methods have been available in existing research as effective and adaptive interventions to improve patient resilience (Casellas-Grau et al., 2014; Ding et al.,

2024; Polizzi & Lynn, 2021), so far there are no studies targeting on what and how effective of these emotional strategies adopted by the patients. Emotional granularity contributes to this process by enabling patients to recognize specific emotional experiences, which in turn enables them to more effectively apply targeted emotion regulation strategies. Therefore, we hypothesized that by increasing emotional granularity in young and middle-aged CRC patients, patients could use emotion regulation strategies more effectively in the face of the emotional complexity of the cancer journey, thereby improving patient resilience and promoting overall health as well as quality of survival.

Methods

1. Aim

To clarify the relationship between emotional granularity and resilience, explore young and middle-aged CRC patients' emotional challenges and investigate how resilient patients leverage emotional granularity to support adaptive emotion regulation strategies, as well as examine patients' perspectives on interventions development.

2. Study design

This study was designed as a sequential mixed-method study that first collects and analyses quantitative data and then qualitative data to explain or generalize quantitative data (Creswell & Clark, 2017). The study will include two-phases, including quantitative phase to explore the association among emotional granularity, emotional regulation and reliance in young and middle-aged CRC survivors, then a qualitative phase to further elucidate the findings from the quantitative phase and delve deeper into the emotional challenges faced by young and middle-aged CRC patients, as well as their perspectives on AI-integrated emotional interventions.

3. Participants

The research design for the first quantitative phase is a cross-sectional, anonymous survey. young and middle-aged CRC patients will be recruited consecutively from Chinese medical institutions in Suzhou, Jiangsu Province. Potentially eligible participants will be identified from electronic medical records in accordance with the hospital's strict data security policies. The inclusion criteria are (1) young and middle-aged adult patients (age in the range of 18-60 years); (2) patients diagnosed with CRC; (3) patients have completed primary treatments (e.g., surgery, chemotherapy, and/or radiotherapy) without experiencing a recurrence of CRC; and (4) patients

able to use a smartphone and agree to participate in the study. The exclusion criteria are (1) patients who have not been informed of their cancer diagnosis due to family decision to withhold information; and (2) patients suffering from severe conditions that may affect participation or assessment, such as significant cognitive impairment, psychiatric disorders, or communication disorder. Before the survey, patients are required to sign an informed consent form. Regarding the sample size, Monte Carlo simulation for mediation analysis will be used (Donnelly et al., 2023; Fritz & MacKinnon, 2007). We will begin by specifying our population parameters based on the smallest effect size of interest (SESOI). In our mediation model, the following paths were defined: Path a is the effect of emotional granularity on emotional regulation. Path b is the effect of emotional coping on resilience (while controlling for emotional granularity). Path c is the direct effect of emotional granularity on resilience after accounting for the mediator (Figure 4). standardized example value of a=0.5, b=0.4 (Donnelly et al., 2023). 200 participants will reliably ensure at least 80% power. Moreover, considering a 15% attrition rate, the sample size should be 236 at least.

For subsequent qualitative phase, semi-structured qualitative individual interviews will be used to collect in-depth insights from young and middle-aged CRC survivors from quantitative part. According to the sample size requirements for interview in qualitative research in social sciences (Bekele & Ago, 2022), 20-25 participants will be selected based on quartiles of CDRS scores in the quantitative phase to explore common perspectives as well as emotional strategies employed by patients in different score bands to ensure that the qualitative interviews include a diverse range of perspectives, and will capture variations in emotional coping strategies and resilience.

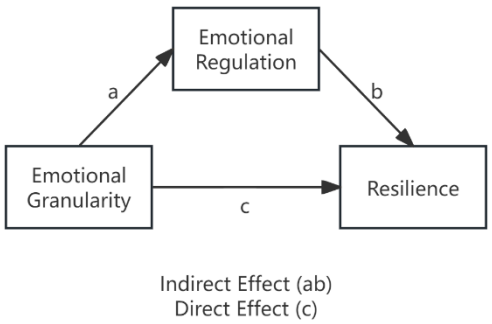

Figure 4 Path assumption

4. Data collection for quantitative phase

Nurses or post graduate nursing students will be recruited as research assistants to support participant screening, data collection, and follow-up assessments. They will be responsible for identifying eligible participants and explaining the study procedures. After providing informed consent, participants will complete the questionnaires. For participants who have difficulty reading the written questions, the research assistants will read the questions and options verbatim without adding any interpretation. After the questionnaires are submitted, the research assistants will check them for completeness. See appendix 1 for the questionnaire used for the survey. Measurement tools used for the survey will include the following.

General Information Questionnaire

The general information questionnaire will be self-designed after literature review. The questionnaire includes age, sex, nationality, marital status, education, occupation, religious beliefs, monthly per capita household income, payment method of medical expenses, and other diseases. CRC family history, cancer types, metastasis, treatments received, stoma-related information.

The Chinese version of Range and Differentiation of Emotional Experience Scale (RDEES)

Emotional granularity, also referred to as emotional differentiation or emotional complexity will be evaluated by RDEES. It was developed by American scholars Kang and Shaver in 2004 (Kang & Shaver, 2004). The original English version comprises 14 items across two subscales: Range and Differentiation. In 2013, Chinese researchers deleted 3 items from the original scale after translation and cultural adjustment, and finally obtained the Chinese version of the RDESS, which consists of 11 items, including the range of emotional experience and emotional experience differentiation dimensions, with a Cronbach's alpha coefficient of 0.82 (Wang H. et al., 2015).

The Chinese Version of Difficulties in Emotion Regulation Scale (DERS)

The version of the scale was developed in 2004 with 36 items to assess multidimensional challenges in emotion regulation, including nonacceptance of emotions, difficulties engaging in goal-directed behavior, impulse control issues, lack of emotional awareness, limited access to regulation strategies, and lack of emotional clarity (Gratz & Roemer, 2004). The English version has Cronbach's α of 0.93 and test-retest reliability (ICC = 0.88) over four to eight weeks.

Then the scale translated by Wang et al. in 2007 (Wang L., 2007), The Chinese version has Cronbach's α of 0.87, and test-retest reliability (ICC = 0.87).

The Chinese version of 10-item Connor-Davidson Resilience Scale (CDRS)

The original version of the scale is a self-administered questionnaire with one single dimension(Campbell-Sills et al., 2006), which originated from the original 25-item one (Connor et al., 2003). It has 10 items with five response options (0 = never; 4 = almost always). The final score of the questionnaire is the sum of the responses of each item (range 0 - 40), where higher scores indicate higher resilience capacity. It was translated into Chinese in 2017 (Ye et al., 2017). The Chinese version of CD-RISC-10 retains its single dimension in the original English version. Cronbach's α for the entire scale was 0.88, and the test-retest was 0.73.

5. Data collection for qualitative phase

A preliminary interview outline will be developed based on a review of relevant literature and pre-tested with three patients before finalizing the interview guide. All interviews will be conducted by postgraduate nursing students with qualitative research experience. Participants will be briefed on the purpose and procedures of the interviews before conducting the prearranged interviews in the clinic. Each individual interview lasted 30-60 minutes; the sample will be considered saturated until no new themes arose. We will conduct interviews in the following aspects. (1) Background and emotional journey; (2) Emotional needs and support; (3) Strategies of emotional regulation and improving emotional granularity; (4) Attitudes toward ai-driven tools, perceived emotional appropriateness, cultural sensitivity, accessibility barriers, and suggestions for improvement. See appendix 2 for the interview guide.

6. Data analysis

6.1 Quantitative data analysis

Statistical analyses will be conducted using IBM SPSS Statistics 27. Participant characteristics will be described as medians (quartile intervals) for continuous variables and numbers (percentages) for categorical variables. Group differences in emotional granularity, emotional coping, and resilience will be examined using one-way ANOVAs and independent samples t-tests. Pearson's bivariate correlations will assess associations among emotional granularity, emotional coping, and resilience. Confirmatory factor analysis (CFA) will be performed using IBM SPSS Amos 27.0 to validate the measurement models, with acceptable model fit indices defined as $\chi^2/df \leq 3$, GFI, AGFI, CFI > 0.90, and RMSEA < 0.06 (Awad et al., 2022). A simple

mediation model will test whether emotional regulation mediates the relationship between emotional granularity and resilience using bootstrapping (5,000 resamples) and bias-corrected confidence intervals (Igartua & Hayes, 2021). Missing data will be handled using multiple imputation, and two-sided $p < 0.05$ will be considered statistically significant.

6.2 Qualitative data analysis

Interview transcripts and field notes will be analyzed within 24 hours using NVivo 15 and conventional content analysis. Data collection and analysis will be iterative, with open coding of transcripts and reflective journals to generate themes and sub-themes. Themes will be refined through constant comparison and team discussion to ensure credibility and confirmability.

6.3 Data integration

Quantitative and qualitative data will be integrated using a sequential explanatory design. A comparison matrix will link quantitative findings with qualitative themes, enabling interpretation of how emotional granularity and emotional regulation relate to resilience. Discrepancies or unique insights will be discussed and interpreted in context, and final reports will present a synthesized perspective combining statistical evidence and participants' experiences.

7. Ethical Considerations

This study will comply with the Declaration of Helsinki. Ethical approval of the research protocol will be obtained from the Human Subjects Ethics Sub-Committee (HSESC) of the Hong Kong Polytechnic University and the ethics committee of the medical institutions in Suzhou. Informed consent will be obtained from each participant. The principles of voluntariness, non-maleficence, beneficence, and confidentiality will be emphasized throughout the research process.

For the quantitative phase, all survey data will be de-identified and stored on encrypted drives with access restricted to authorized research team members only. Hard copy documents, if any, will be stored in locked cabinets in secure offices. All information will remain confidential, and no identifying information will be disclosed in any reports, presentations, or publications. The data will be retained for five years after publication of the study findings, after which all personal identifiers and linked codebooks will be permanently destroyed, leaving only fully anonymized data for archival purposes.

For the qualitative phase, audio recordings will be collected only with participants' consent and anonymized during transcription. All transcripts and notes will be stored securely on password-protected, encrypted drives with access limited to authorized research team members. The data will be retained for five years after publication of the study findings, after which all personal identifiers and linked codebooks will be permanently destroyed, leaving only fully anonymized data for archival purposes.

All online patient information will be stored in encrypted format, and de-identification will be applied to patient text and voice data used for analysis.

8. Quality and Rigor

The rigor of this mixed-methods study will be addressed through strategies to ensure credibility, dependability, confirmability, and transferability. For credibility, validated quantitative instruments will be used, and data collectors will follow standardized procedures for participant recruitment, informed consent, and questionnaire administration. For the qualitative strand, member checking will be conducted by sharing transcripts or summarized interpretations with participants to verify accuracy. In addition, two researchers will independently code and analyze qualitative data, and discrepancies will be resolved through discussion and consensus within regular research team meetings. Field notes will be recorded during both quantitative and qualitative data collection to capture contextual details and non-verbal cues, supporting interpretation. For dependability, a detailed description of the entire research process, including study design, sampling, data collection procedures, analysis methods, and reporting, will be documented to allow for external scrutiny and replication. To ensure confirmability, reflexivity will be embedded throughout the study. The primary researcher will reflect on potential biases and how personal values and assumptions might influence data interpretation. Reflexive notes and supervisory debriefings will be maintained to provide an audit trail of key analytic decisions. For transferability, thick descriptions of the study context, participant characteristics, and findings (supported by direct quotes) will be provided to enable readers to determine applicability to other settings or populations. Integration of quantitative and qualitative findings will further enhance the depth and contextual relevance of the conclusions.

Project Timeline

Year		2024		2025						2026	
Month		9-	11-	1-	3-	5-	7-	9-	11-	1-	3-

			10	12	2	4	6	8	10	12	2	4
Scoping Review												
Revision and ethical clearance												
Mixed-methods Study	Quantitative Phase	Recruitment of participant & Survey										
		Data analysis										
	Qualitative Phase	Recruitment of participant & Interview										
		Data analysis										

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Appendix

1. Emotion-resilience assessment questionnaire for young and middle-aged colorectal cancer patients (Chinese version)

第一部分：一般资料调查表

1. *住院号（即患者唯一编号）：
2. *年龄：_____ 岁
3. *性别：□男 □女
4. *就业状态：□在职 □学生 □离/退休 □待业 □失业/无业
5. *婚姻状态：□已婚 □未婚 □离异 □丧偶
6. *结直肠癌家族史：①有 ②无
7. *其他疾病：①无 ②糖尿病 ③高血压 ④心脏病 ⑤其他_____
8. *肿瘤位置：□结肠 □直肠 □结直肠 □其他_____
9. *结直肠癌 TNM 分期：T__N__M__
10. *是否有造口：①无
    ②有（□结肠造口 □回肠造口；**造口时间**：_____年____月_____日）
11. *是否转移：_____（如是，请填写转移部位）
12. *所接受过的治疗（可多选，请在横线上写出治疗开始和结束日期）：
    □手术_____ □化疗_____（请标注化疗方案）
    □放疗_____ □靶向_____ □免疫_____ □其他_____

13. *最后一次接受主要治疗的日期：_____年_____月_____日

14. *目前所遗留的肿瘤/造口相关并发症：

肿瘤/术后相关并发症	造口相关并发症	其他（请详细填写）
□无	□无	
□低前切除综合征	□造口渗漏	
□肠道功能障碍	□腹旁疝	
□肠道梗阻	□周围皮肤并发症	
□吻合口狭窄	□造口脱垂	
□吻合口瘘	□造口狭窄	
□局部复发及相关并发症	□造口回缩	
□肿瘤复发/转移	□高排出造口	
	□造口梗阻	
	□感染与出血	

个人情况调查表

1. **家庭人均月收入（元）**：□<3000 □3001~6000 □6001~9000 □＞9000
2. **居住地**：□城镇 □农村
3. **付费方式**：□全公费 □城镇基本医疗保险 □新型农村合作医疗

□ 商业医疗保险 □其他社会保险 □贫困救助 □全自费

□ 其他 _____（请具体填写）

第二部分 RDEES

请你仔细阅读每一项题目，在每一题后**最符合**自己情况的数字上画圈 “○”

1 表示“这完全**不**是对我的描述”。**5** 表示“这是对我的**精准**描述”。

题目	**符合程度** 这完全不是对我的描述→这是对我的精确描述				
1. 我知晓特定情绪的不同差异	**1**	**2**	**3**	**4**	**5**
2. 我一生中已体验到各种各样的情绪	**1**	**2**	**3**	**4**	**5**
3. 每种情绪对我而言都有着特殊涵义	**1**	**2**	**3**	**4**	**5**
4. 我能领悟到类似情绪之间的细微差异（如沮丧和抑郁；生气和恼怒）	**1**	**2**	**3**	**4**	**5**
5. 我情感丰富	**1**	**2**	**3**	**4**	**5**
6. 我知道每种情绪都蕴含着完全不同的意义	**1**	**2**	**3**	**4**	**5**
7. 在日常生活中，我并没有体会到纷繁复杂的情绪	**1**	**2**	**3**	**4**	**5**
8. 如果用颜色来形容不同的情绪，我可以注意到每一种颜色（情绪）之间的细微差别	**1**	**2**	**3**	**4**	**5**
9. 我能够意识到自身各种情绪感受之间的细微差别	**1**	**2**	**3**	**4**	**5**
10. 我倾向于体验到各种不同的情绪感受	**1**	**2**	**3**	**4**	**5**
11. 我擅长区分那些意思紧密关联的情绪词间的细微差异	**1**	**2**	**3**	**4**	**5**

第三部分 DERS

指导语：下面的量表用于评估您的情绪调节，每个问题有 5 种不同答案可供选择，请根据您最近的实际情绪调节体验实际情况，选择相应的答案打勾“✓”。

	从不	偶尔	有时	经常	总是
1. 我明白我的感受					
2. 我会注意我的感受是怎样的					
3. 我有过情绪极为强烈和情绪失控的经历					
4. 我不清楚自己的感受是怎样的					
5. 我很难弄明白自己的感受					
6. 我会留意自己的感受					
7. 我能清楚地知道自己的感受是怎样的					
8. 我在意我感受到什么					
9. 我对于自己的感受如何感到困惑					
10. 当心烦意乱时，我能觉察我有这个情绪					
11. 当心烦意乱时，我为有这种情绪而生自己的气					
12. 当心烦意乱时，我为有这种情绪而感到尴尬难堪					
13. 当心烦意乱时，我难以把事情（任务）完成					
14. 当心烦意乱时，我会变得失控					
15. 当心烦意乱时，我相信我会一直处于这种状态很长时间					
16. 当心烦意乱时，我相信最后我会感到相当抑郁					
17. 当心烦意乱时，我相信我的感觉是有根据和重要的					
18. 当心烦意乱时，我难以专注在其他事上。					
19. 当心烦意乱时，我感到失控					
20. 当心烦意乱时，我仍然能把事情做完					
21. 当心烦意乱时，我为自己有这种感受而感到羞愧。					
22. 当心烦意乱时，我知道我能够找到方法让自己最后的感觉好一些					
23. 当心烦意乱时，我觉得好像自己是软弱的。					
24. 当心烦意乱时，我觉得我好像仍能控制自己的行为。					
25. 当心烦意乱时，我对于自己有这样的感受感到内疚。					
26. 当心烦意乱时，我难以集中注意力					
27. 当心烦意乱时，我难以控制自己的行为					
28. 当心烦意乱时，我相信无论做什么都不能使自己感受好一些。					
29. 当心烦意乱时，我对于自己有这种的感受而感到恼火。					
30. 当心烦意乱时，我开始感到自己非常差劲。					
31. 当心烦意乱时，我相信能做的只有任自己陷在这种情绪中。					
32. 当心烦意乱时，我会最自己的行为失去控制。					

33. 当心烦意乱时，我难以考虑其他的任何事情。					
34. 当心烦意乱时，我会花时间去弄清楚自己真正的感受是什么					
35. 当心烦意乱时，我需要长时间才能够感觉好些					
36. 当心烦意乱时，我感到情绪极其强烈难以抵抗					

第四部分 CD-RISC-10

指导语：请根据您在最近一个月在遇到问题或挑战时的实际感受，在最符合该条目的答案打勾“✓”。

	从不	很少	有时	经常	几乎总是
1. 当事情发生变化时，我能够适应					
2. 无论人生路途中发生任何事情，我都能处理它					
3. 面临难题时，我试着去看到事物积极的一面					
4. 历经磨难会让我更有力量					
5. 我很容易从疾病、受伤或困难中恢复过来					
6. .我相信即使遇到障碍我也能够实现我的目标					
7. 压力之下我仍然能够集中精神地思考问题					
8. 我不会轻易地被失败打倒					
9. 在处理生活中的失败和困难时，我是个坚强的人					
10. 我能够处理一些不愉快或痛苦的感觉，如悲伤、害怕和生气					

2. Individual Interview Guide for Young and Middle-Aged CRC Patients

Hello! Thank you very much for agreeing to participate in this interview.

We are conducting a study to: Explore the emotional needs of young and middle-aged colorectal cancer (CRC) patients, and how resilient patients leverage emotional granularity to support positive coping strategies. And Investigate patients' perspectives on AI-integrated emotional intervention programs, to help further development of an AI-integrated emotional intervention to enhance resilience in young and middle-aged CRC patients.

This interview will last approximately 30–60 minutes. All information is for academic research only, and you may decline to answer or stop at any time. If you have any questions, please feel free to ask before we begin. Shall we start?

2.1 Background and Emotional Journey

- Could you describe your emotional journey since your CRC diagnosis?

Prompt: What were your main concerns and feelings at each stage (early, middle, late)? How did your emotions fluctuate after chemotherapy, surgery, etc.?

2.2 Emotional Needs and Support

- What have been your most urgent emotional needs during your cancer journey?

Prompt: Which types of support were most effective, whether from family, friends, or healthcare providers? Were any needs unmet? How and when would you prefer to receive support (in person, by phone, online)?

- Have you received emotional support from family, friends, nurses or other healthcare providers?

Prompt: In what form? How did it help you? What could have been better?

2.3 Coping Strategies and Emotional Granularity

- What coping strategies do you typically use when feeling down or stressed?

Prompt: Can you give an example? Do these strategies differ at home, work, or in social settings?

- Do you differentiate among emotions (e.g., "anxiety," "fear," "worry") and choose different strategies accordingly?

Prompt: Do you find such granularity helpful in managing your emotions? Would you like to share some ways of differentiating emotions that you have found to be effective?

2.4 Perspectives on AI-Integrated Emotional Interventions

- If there were an AI-based tool that could identify and respond to your emotions in real time, would you be willing to try it?

Prompt: Would you prefer voice feedback, text messages, graphical reports, etc.?

- What concerns do you have about AI-driven emotional support?

Prompt: Data privacy? Technical reliability? Other issues?

- How do you think an AI tool could best complement support provided by nurses or human caregivers?

2.5 Suggestions for Improvement

- What are your expectations for a future AI-integrated emotional intervention program?

Prompt: Suggestions on usage scenarios, frequency, interaction style?

- What should the research team, especially the nurses involved, pay special attention to when designing and implementing the program?

Prompt: Communication with patients, feedback mechanisms, etc.?

Conclusion: Thank you very much for your time and honest sharing! Your experiences and suggestions will be invaluable in optimizing our AI emotional intervention program to enhance resilience in CRC patients.