Community knowledge toward risk prediction of colorectal cancer

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Abstract

Background: Colorectal cancer (CRC) is considered as a significant worldwide health problem1 and there is strong suggestion that screening can reduce CRC mortality rate. Thus, the effectiveness of awareness toward screening may be encouraged screening performance and screening intensity to those at highest risk. **Aim:** to find out community knowledge toward risk prediction of colorectal cancer at port-said city, Egypt. **Subject and methods:** A descriptive cross-sectional study was carried out using A purposive sampling on 220 female from age more than 20 year at outpatient clinics from governmental hospitals (Alsalam general ,Port-fouad general hospital Algawhara hospital at Port-Said city, Egypt responded to the self-administered online survey . Statistical tools such as frequency, percentage, were used for the descriptive analysis. **Results:** There are a statistically significant relation was found between participant's intentions to be screened for colorectal cancer with their socio-demographic characteristics mainly in the items related to level of education and their occupation with ps= (0.015, 0.005) respectively . **Recommendations:** The community need for receive regular; periodic in-service preventive program contains early signs, risk factors, and screening methods of colorectal cancer. There is an evident necessitate for designed modules, workshops, social media regarding preventive strategies of colorectal cancer and screening. Further studies are needed to study barriers of colorectal cancer screening on the large sample and wide geographical areas.

Keywords: Community knowledge, risk, prediction, colorectal cancer

Introduction

Colorectal cancer (CRC) is considered as the third most common occurrence of cancer and the second leading cause of cancer mortality universal, accounting for 1.85 million incident cases and ~880,000 deaths in 2018. Cancer burden can be decreased with population-based screening, which has been established to be effective in decreasing mortality and preventing the Colorectal Cancer occurrence. Presently, colonoscopy is viewed as the golden standard technique for early diagnosis but its common use is limited by its invasive approach, dietary control requirement, and costs **(*Raut et al., 2021*).**

In Europe and the United States Colorectal cancer (CRC) is considered the fourth leading cause of cancer-related death. So, identifying the disease at an early stage improves outcomes which risk estimate models including illustration of combine multiple risk factors and symptoms have the probable to progress timely diagnosis (***Williams et al.,2016***).

According to ***Cueto-López et al.,2019*** the Risk prediction models objective at identifying people at higher risk of developing a target disease. Assessing the constancy of feature selection/ranking algorithms becomes a significant subject when the objective is to investigate the structures with more prediction influence.

However, Colorectal cancer screening diminishes incidence and mortality rates. Risk models based on phenotypic variables have fairly good judgment in external validation and may progress effectiveness of screening. So, public health modeling studies suggest that, if detected by risk models, the range of initial ages for screening would be numerous years greater than using family history alone. (***McGeochet al.,2019***)

The uptake of colonoscopy is low in individuals at risk of colorectal cancer. A risk-prediction score (RPS) in a large community-based example at high risk of CRC to empower more exact risk stratification and to encourage and rise the interest rate of colonoscopy (***Liang et al.,2022***)

Lately, the Nurses' Health Study has applied metabolomics to the biology of cancer, potentially uncovering innovative pathways in etiology and survival, as well as new targets for

intervention. These metabolomics measures are being expanded to evaluate health suggestions in the group with concern of hypertension, chronic obstructive pulmonary disease, asthma, and fertility, in addition to, more comprehensive data on the effect of alcohol use and disease outcomes. (***Colditz et al., 2016***)

The prognosis of Colorectal cancer is highly linked with its stage. It is possible to discover and treat premalignant adenomatous polyps and early-stage localized cancers with early diagnosis programs . Notifying people, risk determination and the implementation of screening programs are major for detection of cancer in the asymptomatic phase. (***Dönmez et al., 2022***)

In this regard**,** Cancer prediction tools are extensively available to clinicians, and the data recovered from these tools can support with patient counseling sessions on risk, prognosis, treatment, and recurrence. As beneficial as a prognostic discussion with a patient regarding a cancer diagnosis was based on physician decision (***Doyle-Lindrud, 2015***).

Research Problem:

Accurate evaluations of overall survival are predominantly vital for patients with a diagnosis of cancer who need to make decisions regarding the risks and benefits of active versus supportive treatment (eg, whether to have surgery, chemotherapy, radiotherapy, or palliative care) ***(Hippisley-Cox & Coupland.,2017)***

The Aim of the study:

Therefore, the aim of the current study is to find out community knowledge regarding risk prediction of colorectal cancer at port-said city, Egypt.

Research questions:

- What is the knowledge level of participants regarding risk prediction of colorectal cancer?
- Are there relations between participant's sociodemographic data with risk intention of screening for colorectal cancer?

Conceptual fame work

Colorectal cancer screening protects lives and is economical. It permits early detection of the pathology, and empowers earlier medical intervention. Even with clinical practice guidelines encouraging screening for average risk individuals, interest remains suboptimal in numerous populations for studies how the health belief model's constructs are associated with colorectal cancer screening.**(*Lau et al.,2020*)**

The health belief model's links with colorectal cancer screening uptake were steady with preventive health behaviours in general. Upcoming studies should perceive how theory-based behavioural interventions can be tailored to justification for the influence of socioecological factors **(*Lau et al.,2020& Rakhshanderou et al ., 2020*) (fig.1)**

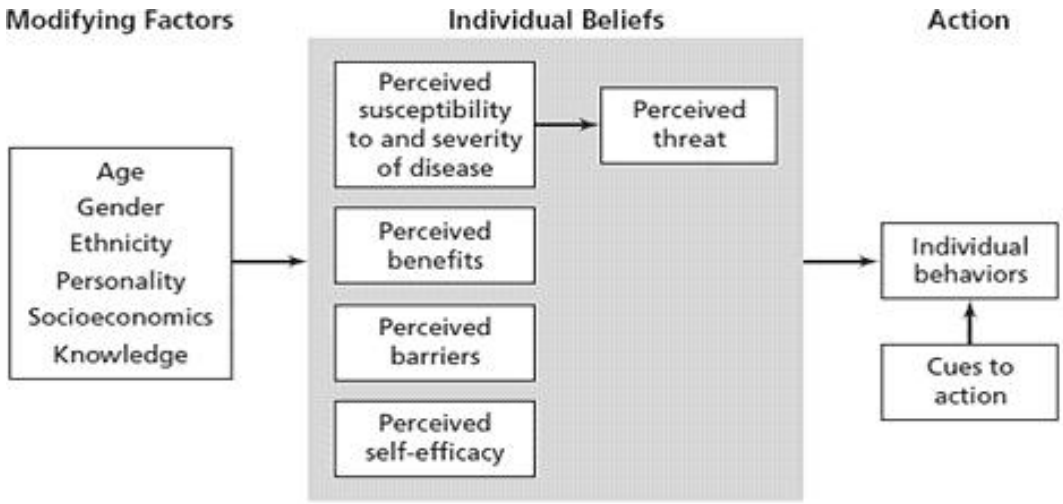

Fig (1): Health Belief Model (***Rakhshanderou et al ., 2020***).

Subjects and Methods

Study Design: A descriptive cross-sectional study

Study setting & sampling:

The study was carried out from 20 December 2020 to May2021. A purposive sampling from all available female participants / client (220 female) from age more than 20 year at outpatient clinics from governmental hospitals (Alsalam general ,Port-fouad general hospital Algawhara hospital at Port-Said city, Egypt responded to the self-administered online survey . This online survey study used as preventive measures of COVID 19 pandemic through prevent spread of infection via papers. An inclusion criterion was as follows: female client who haven't any type of cancer and were willing to participate in the study.

Survey instruments

Data was gathered using self-administered questionnaire contains 3 main parts adapted from ***Molisani ., 2015*** which **first part** consist of Socio-demographic data as age, marital status, occupation, level of education , setting, sources of information . **Second part:** : **Assess**ment of perceptions of colorectal cancer : it includes 12 items divided into 7 items related to knowledge regarding definition, risk factors , clinical manifestations , screening methods, preventive diet , treatment , and prognosis of colorectal cancer. and 5 items related to screening knowledge of colorectal cancer as detection of screening , examination increase chance for treatment , proper time for check –up, important of check –up . **Third part:** it includes 16 items to assess attitude regarding colorectal cancer prediction. There were four alternative responses to each question: 1) strongly agree, 2) agree, 3) Neutral, and 4) Disagree 5) Strongly Disagree. Each response was given a value from 1 to 5

Data gathering

Clients were invited to participate in an online poll by sending personal messages or posting invitations on their personal social media accounts, such as Twitter and Facebook if they are used social media channel or by the researcher to help participant and answer questions on behave of them. This invitation includes a consent form that informs them of their rights and responsibilities, as well as the fact that no personally identifiable information that may be linked to their responses will be included. If the respondents are interested, they can access the questionnaires by clicking on the embedded web link provided or done by researcher especially for illiterate clients. The welcome screen on the website invites female clients to participate, as well as a consent form. The willing participants were also instructed to thoroughly read the consent form before clicking "I accept" on the web connection. Following the client's approval to participate, the socio- demographic data will appear. The questionnaire was then followed by a statement. Expressing gratitude for the participant's engagement Once they has completed the course, when she is finished answering the questions, she was click the submit button icon. It took about 10- 15 minutes to complete the questionnaire. After the data was collected, the web link was closed, and the data was deleted , retrieved and saved .

Ethical consideration

The participants gave their informed consent, which stated the research objective and goal, their voluntary involvement, their right to autonomy and secrecy, and their freedom to withdraw from the study. Furthermore, the site connection did not collect IP addresses or any other data.

Data analysis

Statistical treatment: Descriptive statistics and testing of hypothesis were used for the analysis. The data were analyzed using SPSS V.20.0 (SPSS Inc; Chicago, IL, USA). The Chi-square test was used to examine the relation between different variables. $P < 0.05$ was considered as statistically significant.

Results

Table (1) illustrates a total of 220 participants in the study, more than half (63.7%) of the participants below 30 years old followed by (81.2%) of them married. Additionally, slightly more than half (58.3%) from university education level, about two third of them (79.2) workers. finally, the majority of participants (98.2%) lived in rural areas.

Table (2) showed that the distribution of studied sample perceptions which the correct answers regarding Treatment of colorectal cancer (76.2%) , dietary prevention of colorectal cancer

(69.1 %), Clinical Manifestations of colorectal cancer (56.1%).

As indicated in **Table (3),** showed slightly near half of participants (47.5%) have knowledge of useful detection methods of colorectal cancer by investigations, (65.5%) of them know that examination increase chance for treatment , (88.8%) haven't performed before ultrasound or abdominal X-ray while (66.4%) of them express that proper time for check-up of colorectal cancer when there are manifestations of the disease and (93%) exploring that the importance of performing check-up when the doctor order that.

Table (4) describe that there are a statistically significant relation was found between participant's intentions to be screened for colorectal cancer with their socio-demographic characteristics mainly in the items related to level of education and their occupation with ps= (0.015, 0.005) respectively

Figure 1: Shows that most of participant's sources of information regarding colorectal cancer acquired from internet (36 %) while (25%) of them acquired their information from television.

Table (1): Distribution of studied sample according to their socio- demographic characteristics (N=220)

Socio- demographic characteristics	No.	%
Age		
30-	142	63.7
31-	42	18.8
50-	25	11.2
>60	11	6.3
Marital status		
Single	33	14.8
Divorced	7	4.0
Married	181	81.2
Education level		
Illiterate	5	3.6
Primary	3	1.3
Secondary	82	36.8
University	130	58.3
Occupation		
House wife	42	18.8
Not worked	2	2
Workers	176	79.2
Setting		
Rural	216	98.2
Urban	4	1.8

Table (2): Distribution of studied sample knowledge of colorectal cancer (N=220)

Items	True		False		I don't know	
	No.	%	No.	%	No.	%
Definition of colorectal cancer	88	39.5	32	14.3	100	46.2
Risk factors of colorectal cancer	53	23.8	41	18.4	126	57.8
Methods of screening colorectal cancer	111	49.8	45	20.2	64	30.0
Clinical Manifestations of colorectal cancer	125	56.1	31	13.9	64	30.0
Dietary prevention of colorectal cancer	154	69.1	24	12.1	42	18.8
Treatment of colorectal cancer	170	76.2	19	9.9	31	13.9
Prognosis of colorectal cancer	77	34.5	74	34.5	69	30.9

Table (3): Distribution of studied sample knowledge regarding colorectal cancer screening (N=220)

	No.	%
Colorectal cancer detected By		
Doctors	49	22.0
Detect manifestations	68	30.5
Investigations	103	47.5
Examination increase chance for treatment		
Yes	146	65.5
May be Affect	67	30.0
No Effect	7	4.5
Make ultrasound / abdominal X-ray		
Yes	25	11.2
No	195	88.8
Proper time for check -up		
Don't done	5	2.2
Every 6 Months	43	19.3
6 Months to 1 year	12	5.4
More than 2 years	15	6.7
When there are manifestations	145	66.4
Importance of done check - up		
Doctor orders	182	93.0
Routine checkup	38	17.0

Table (4): Relation between participant's intentions to be screened for colorectal cancer with their socio-demographic characteristics

Socio-demographic data	Participant's intentions to be screened for colorectal cancer		Test of Sig.	p
	Min. – Max.	Mean ± SD.		
Age				
15-	6.0 – 15.0	11.87 ± 1.56	F= 0.801	0.494
18-	9.0 – 14.0	11.69 ± 1.77		
20-	9.0 – 14.0	11.72 ± 1.46		
>20	10.0 – 14.0	11.21 ± 1.19		
Marital status				
Single	9.0 – 15.0	12.12 ± 1.45	F= 1.966	0.142
Married	11.0 – 14.0	12.44 ± 0.88		
Divorced	6.0 – 15.0	11.68 ± 1.61		
Education level				
Illiterate	9.0 – 12.0	10.13 ± 1.55	F= 3.571*	0.015*
Primary	12.0 – 13.0	12.67 ± 0.58		
Secondary	9.0 – 14.0	11.74 ± 1.55		
University	6.0 – 15.0	11.88 ± 1.55		
Occupation				
House wife	9.0 – 14.0	11.10 ± 1.21	F= 4.334*	0.005*
Employee	6.0 – 14.0	12.26 ± 1.55		
Workers	12.0 – 13.0	12.50 ± 0.71		
Others	9.0 – 51.0	11.82 ± 1.63		
Setting				
Rural	6.0 – 15.0	11.76 ± 1.58	t= 1.252	0.212
Urban	12.0 – 14.0	12.75 ± 0.96		

F: F test (ANOVA) t: Student t-test *: Statistically significant at $p \leq 0.05$

Discussion

Colorectal cancer (CRC) is considered as a significant worldwide health problem1 and there is strong suggestion that screening can reduce CRC mortality rate. Thus, the effectiveness of awareness toward screening may be encouraged screening performance and screening intensity to those at highest risk (***Smith et al., 2018***)

Regarding Sociodemographic characteristics of study sampling , the present study revealed that more than half of the participants below 30 years old followed by more than two-third of them are married. Additionally, slightly more than half from university education level, about two third of them are workers. The majority of participants were lived in rural areas. These findings goes in the same way with ***Tabung et al., 2018*** who found that Colorectal cancer is considered as the third greatest public type of cancer among both men and women in the United States which Inflammation shows a significant role in cancer progress. While, in Turkey , ***Gözüm ., 2018*** revealed that agricultural workers with low socioeconomic level are particularly at risk for colorectal cancer due to the powerful of use of pesticides. In Saudi Arabia, ***Al-Thafar et al., 2017*** notified that colorectal cancer is ranks first among men and third among women. However, this type of cancer is one of the most preventable types of cancer.

Regarding participant's risk knowledge of colorectal cancer, the present study revealed that more than two- third of studied sample submit correct answers regarding treatment of colorectal cancer and dietary prevention of colorectal cancer while more than half of them submit correct answers regarding clinical Manifestations of colorectal cancer. These findings goes in the same way with ***Aleksandrova et al., 2021*** who stated that LiFe CRC score based on age and lifestyle data truly detected persons at risk for occurrence of colorectal cancer among European people and might donate to developed prevention through encouraging modify their lifestyle .

In Japan, ***Abe, 2017*** found that a developed an effective model for predict the risk of Colorectal cancer might be efficient for prevention. Also, ***Zheng et al., 2020*** mentioned that developed a new colorectal cancer risk prediction model in addition to personal characteristics and other risk factors considered as risk-based clinical decision-making.

In England, ***Hippisley-Cox & Coupland., 2017*** highlighted on that equation estimated for risk prediction of patients with colorectal cancer secretarial for an individual's clinical and demographic characteristics And deliver more individualised accurate information for patients with colorectal cancer to apprise decision making and development.

Also, ***Mosli et al., 2017*** who found that a significant proportion of PHPs do not cope with colorectal cancer screening recommendations despite a wide belief that screening is effective. Male PHPs with lower beliefs appear to be less likely to recommend screening.

As regarding knowledge of colorectal cancer screening. the present study revealed that slightly near half of participants have knowledge of useful detection methods of colorectal cancer by investigations , more than half of them know that examination increase chance for treatment , most of them haven't performed before ultrasound or abdominal X-ray while more than half of them express that proper time for check-up of colorectal cancer when there are manifestations of the disease and the most of them exploring that the importance of performing check-up when the doctor order that. These findings supported with ***Loud & Murphy, 2017*** who mentioned that Cancer screening has donated to decreasing the morbidity and mortality of cancer. Powers to recognize the biological aspect of carcinogenesis, and the progress of new measures for cancer screening is very important. Thus, nurses are well-situated to implement awareness of cancer screening benefits in the 21st century through their practice, research, educational strengths, and advocacy.

According to ***Gupta et al., 2014*** Next adjusting for outdated factors, trust in PCP remained the only significant carter of CRC screening completion among low-income patients. Involvements to encourage CRC screening may be enhanced by including efforts to increase patient trust in PCP.

In Europe, ***McGeoch et al., 2019*** stated that risk model prediction for colorectal cancer considered a key for public health to recognize the suitable age for starting screening and check-

up for colorectal cancer. While, in China, ***Huang et al., 2017*** reported that the majority of high-risk people had knowledge deficiency regarding colorectal cancer screening. But most of them held a positive attitude towards the importance of colorectal cancer screening. So, the direction of awareness should be started with develop educational scheme and to enhance colorectal cancer awareness and screening culture and Health care providers plays an important role in advise high-risk individuals to regularly screening and educate them regarding cancer risk.

Nutrition and lifestyle considered as a modifiable as risk factors for colorectal cancer (CRC). however, modifications of Lifestyle-based risk models may aid the identification of high-risk individuals, director referral to screening and encourage behaviour change (***Aleksandrova et al., 2021***). In australia **,** ***Milton et al.,2021*** reported that a new strategies for prediction of a colorectal cancer risk include using of a parallel RCT testing clinical usefulness. The study recognized that this method stressed on the importance of co-design input to give an intervention as CRISP sustainable with other risk methods.

In Saudi Arabia, ***Alshammari et al., 2020*** concluded that the participant's knowledge and early screenings of Colorectal cancer are inadequate. They would undergo early screening if their doctors advised them to do that. While ***Tfaily et al.,2019*** In Lebanon stressed on serious active measures by health care sectors, authoritative groups, primary care physicians, and awareness to block the gap in awareness of colorectal cancer and to ease the barriers and misunderstanding regarding this disease.

Besides, ***Yu et al., 2022*** stated that the prediction tools developed from case-control studies require external validation in high-quality prospective period in order to assess the viability and effect of program regarding incorporating biomarkers for colorectal cancer screening. In addition to, ***Liang et al.,2022*** reported that participants with an increase in the RPS of ≥1 point had a significantly higher risk of colorectal lesions which suggesting for performing colonoscopy in this very high-risk group.

Furthermore, the present study revealed that most of participant's sources of information regarding colorectal cancer acquired from internet while one quarter of them acquired their information from television. These findings goes in the same way with ***Gimeno Garcia et al.,2014*** in Spain who mentioned that there are a positive relationship between knowledge of colorectal cancer, risk perception, and attitudes and willingness to participate in a colorectal cancer screening crusade which many sources of guidance and information enhanced he culture and beliefs regarding colorectal cancer screening acceptance and modifying individual behavior

In the Netherlands, ***Barsom et al., 2021*** stressed on direction of patients who are ready to use video consultation (VC) but are hesitant because they feel they want support . If hesitations are addressed and explained through patient advising, more patients may advantage from getting virtual care in the future.

In Saudi Arabia, ***Althobaiti & Jradi, 2019*** highlighted on that Saudi medical students have inadequate knowledge of Colorectal cancer risk factors and a poor attitude towards its screening. These results add to our thoughtful of missed teaching chances in Saudi medical schools and suggest intervening at the medical school, clinical repetition, and population levels to increase screening repetitions.

Regarding relationship between sociodemographic characteristics and participants risk intention of colorectal cancer. The present study revealed that there are a statistically significant relation was found between participant’s intentions to be screened for colorectal cancer with their socio-demographic characteristics mainly in the items related to level of education and their occupation . These findings goes in the same way with ***Larsen et al., 2017*** who stated that social variation in screening interest was obvious in both men and women in the Danish colorectal cancer screening program, level though the program is free of care and the screening kit is depend on the fecal immunochemical test (FIT) and mailed directly to the individuals.

In Korea , ***Lee et al.,2021*** stressed on that perception of cancer risk , knowledge, attitude and prevention were moderate, while the level of cancer burden was high. Ninety-two participants

reported having undergone cancer screenings, but the types of screening were not linked with their family history. Age, gender, and attitude toward cancer affected cancer prevention behaviors. The cancer screening rate was higher in older participants, in women, and in patients with a longer cancer diagnosis.

In contrast, ***Zheng et al., 2020*** reported that screening for colorectal cancer is effective and costly . The evidence is convincing, even when applied irrespective of personal characteristics except age. However, individuals' colorectal cancer risk factors could inform the use and frequency of specific screening routines.

In Saudi Arabia , Al-Thafar et al., 2017 found that the participant knowledge of colon cancer signs, symptoms, and screening methods were inadequate. Thus, improvement of colon cancer awarness among educators is recommended using health education campaign in Al-Ahsa .

Unfortunately**,** Australia and New Zealand have the utmost rates of colorectal cancer worldwide, with estimated age standardized rates of 44.8 and 32.2 per 100,000 in both men and women respectively. Risk-stratified screening is progressively predictable as a line to maximize the aids and diminish the possible troubles of cancer screening, especially in the period of personalized/care medicine. ***(Walker et al., 2017)***.

In Iran, ***Jeihooni et al., 2017*** reported a significant differences between the two groups in relations of HBM constituents and supposed social care for doing FOBT. Consequently, theory-based educational interventions can be increase individuals' Supposed of severity, Susceptibility, and Benefits and diminish their Perceived Barriers so as to permit and inspire people to perform FOBT. Additionally , ***Gözüm ., 2018*** necessitated in their study on that health professionals should direct agricultural workers to participate in colorectal cancer screenings and should notify workers regarding the locations of conducted screening .

In contrast ***Stoffel & Murphy .,2020*** revealed that patients' risk of Colorectal cancer has been considered largely by age and family history, yet 3 of 4 patients with early-onset Colorectal cancer have no family history of the disease. Rapidly increasing incidence rates in younger people could result from generational differences in nutrition, environmental experiences, and lifestyle factors. These may recognize individuals expected to profit from early screening and specialized investigation**.**

In Saudi Arabia, ***Al Wutayd et al., 2015*** the common of responses reported that screening tools are valuable in colorectal cancer control. However, implementation of alertness programs is necessary to create a strong relation between the public, health centers and educational organizations to raise the level of alertness of colorectal cancer.

Finally, from forgoing discussion, application of educational intervention based on health belief model was effective for enhance the preventative behaviors related to colorectal cancer. On the other hands, awareness of diet, lifestyle behaviors related to colorectal cancer prevention is an important issue. Accordingly, proposing educational programs, including public knowledge, workshops, videos, websites, etc. should be used to advise people about manifestations, early signs, and risk factors concentrating on their perceptions and culture of colorectal cancer (***Rakhshanderou et al., 2020***). Moreover, design and implementation of a training program using Health beliefs model has positive effects on the modifications of dietary behaviour for Colorectal Cancer prevention, and the use of multimedia, because of its attraction and ease of use, seems to be a desirable medium for changing nutritional behaviour. ***(Hatami, 2018)***

Conclusion &Recommendations:

Based on study findings we can conclude that there are a statistically significant relation was found participant's sociodemographic data and risk intention of colorectal cancer mainly in items related to education and occupation. The community need for receive regular; periodic in-service preventive program contains early signs, risk factors, and screening methods of colorectal cancer. There is an evident necessitate for designed modules, workshops, social media regarding preventive strategies of colorectal cancer and screening. Further studies are needed to study barriers of colorectal cancer screening on the large sample and wide geographical areas.

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