Effectiveness of a web-based socio-geriatric pre-consultation tool for older adults in primary care: A randomized controlled trial

Nadia Sourial, Pamela Fernainy, Élise Develay, Djims Milius, Audrey Plante, Marie Authier, Vladimir Khanassov, Géraldine Layani, Janusz Kaczorowski, Yves Couturier, Alayne Adams, Mylaine Breton, Claire Godard-Sebillotte, Paul Hébert, Cyrille Launay, Kathleen Rice, Éric Tchouaket Nguemeleu, Amélie Quesnel-Vallée, Patrick Archambault, Marie-Thérèse Lussier, Colette Dufresne-Tassé, Olivier Beauchet

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Abstract

Background: Pre-consultation tools have been proposed as a solution to support primary care providers in effectively managing the growing number of older adults. Despite older adults making up 25% of primary care consultations, few tools are specifically adapted for them, and most only assess their physical health. The Evaluation SOcio-GERiatrique (ESOGER) tool, a short web-based pre-consultation questionnaire of older adults' physical, mental, cognitive, and social support needs, administered by phone, may provide an effective means of supporting providers in improving patient outcomes in the primary care setting.

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the tool was mentioned during consultation with the health provider.
The primary outcome of interest was self-reported health-related quality of life (HRQoL) as measured by the EuroQol 5D (EQ-5D). Secondary outcomes were self-reported unplanned visits to their family doctor, visits to the emergency department (ED) and hospitalizations within the last three months. Data were collected at baseline and 3 months.
An intention-to-treat (ITT) analysis was carried out for the study outcomes. The primary outcome was analysed using beta regression. Secondary outcomes were analysed using logistic regression. Inverse probability of censoring weighting was used to impute missing data due to censoring.

Results: Of the 452 eligible to participate, 111 were lost to follow up, for a total sample size of 341 (75.4%) participants. No significant differences in the EQ-5D were observed between the intervention and the standard care group (OR = 1.0, 95%CI [0.5, 2.0]) or the secondary outcomes.

Conclusions: ESOGER, a pre-consultation tool in the primary care setting for older adults, did not have an effect on health-related quality of life or unplanned health service use when compared to standard care. The non-significant results of the ESOGER tool could be due to a ceiling effect, a limited follow-up duration, or lack of resources for the implementation of the ESOGER tool. Given the potential of pre-consultation tools to support the management of older adults, further research should explore the conditions under which these tools can lead to positive patient outcomes. Clinical Trial: ClinicalTrials.gov NCT05102890

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Trial Registration: ClinicalTrials.gov NCT05102890

Keywords: older adults; quality of life; primary care; health service use; clinical trial; web-based; pre-consultation tool; eHEALTH

Introduction

Primary care providers face unprecedented challenges in their ability to manage the growing number of older adults with chronic conditions and multifaceted care requirements [1]. In particular, primary care providers often lack time and informational resources to optimize the effective management of their older patients' multiple and varied needs [2,3]. Pre-consultation tools, including pre-assessment forms, educational resources, decision aids, and reminders [4–6] completed prior to a patient's upcoming visit, have been proposed as a solution to address these challenges [7]. Pre-consultation tools have been shown to improve quality of care [7], reduce emergency department visits [8], and improve doctor-patient communication without an increase in consultation time [9].

A number of pre-consultation tools for primary care exist, many of which are disease specific, with some available online [10–13]. In general, evidence of the effectiveness of such tools on health-related quality of life and health service use has been modest. For instance, one pre-consultation tool implemented in the primary care setting demonstrated a nonsignificant decrease in quality of life compared with usual care [14]. Similarly, a geriatric assessment screening tool showed no significant reduction in emergency department readmissions and hospitalizations [15]. Moreover, few tools have been specifically adapted for older patients, who account for 25% of all primary care consultations [14,16–19]. Among the limited number of pre-consultation tools for older patients, few provide a comprehensive assessment of older adults' varied health and social needs [10,17,20]. We sought to evaluate the effectiveness of a candidate pre-consultation tool for older adults in the primary care context, the *Evaluation SOcio-GERiatrique* (ESOGER – French acronym for socio-geriatric evaluation) tool, which provides a web-based, short and multidimensional evaluation of older adults'

physical, mental, cognitive and social support needs [21,22]. The ESOGER tool was previously validated in the hospital setting and subsequently adapted for use in the community setting during the COVID-19 pandemic [22–25]. ESOGER was found to support community providers by providing guidance, fostering continuity of care, and identifying socially isolated older adults [26], yet its impact on patient outcomes is yet to be explored

The objective of this study was thus to evaluate the effectiveness of ESOGER as a web-based pre-consultation tool in improving patient outcomes, specifically health-related quality of life and health service use, for older adults in the primary care setting.

Methods

This study is part of a larger evaluation of the ESOGER tool in the primary care setting which included both a quantitative and qualitative evaluation of its implementation and impact. This study reports on the findings from the quantitative assessment of the impact, findings from the qualitative evaluation are forthcoming.

Study design and participants

This 3-month multi-center, individually randomized, and parallel-group randomized controlled trial was conducted at four university-affiliated interprofessional primary care clinics in the province of Quebec, Canada. Two of the participating clinics were in the urban city of Montreal and two were in a rural region in the North-West of Quebec. Data were collected at baseline and 3 months. The 3-month follow-up period was selected because of time and budget constraints. Inclusion criteria for participants consisted of older adults, aged 65 years old and older, living in the community, able to provide informed consent in English or French and with an upcoming in-person or virtual visit with their health provider in the following 14 days at one of the four participating clinics [27]. This 14-day period was chosen so as to align with the clinics' use of an advanced access model to promote timely access to care [28]. Since the study focused on community-dwelling older adults, those living in long-term care were excluded from the study. Participants were recruited from December 2021 to July 2022 and follow-up data were collected from March 2022 to October 2022. A detailed description of the study protocol is available at ClinicalTrials.gov identifier: NCT05102890 [29]. This study is reported using the CONSORT-EHEALTH reporting guidelines [30].

Recruitment and training

Participants were recruited prospectively in all four clinics. For three of the four clinics, a nurse first screened their patient lists for eligible participants who had one upcoming visit in the following 14 days and collected information on their sociodemographic characteristics including age, sex, and list of chronic conditions, which were entered into a password-protected spreadsheet. Patients who accepted to be contacted for the research study were then phoned by a research assistant and their informed consent to participate in the study was obtained verbally. For the fourth clinic, based on requirements of the clinic's ethics board, eligibility was only assessed once participants provided informed consent.

The research team trained between one and six clinic staff (nurse or quality improvement agent) in each clinic to administer the questionnaire and provided support throughout the data collection process. In each clinic, a one-hour initial training introduced the ESOGER tool and the functionalities of its online platform for data entry, reviewed eligibility criteria, and explained other project tools including the recruitment log, questionnaire guide and use of Microsoft Teams for ongoing exchanges with the research team. In addition, during this initial training, staff practiced entering data for a fictitious participant to familiarize themselves with the tool and online platform.

Staff were invited to practice data entry for 3-5 additional fictitious participants after the initial training. Feedback obtained from the clinics during the initial training served to refine and clarify the project tools. Research team members were available throughout the recruitment period to provide assistance and additional one-on-one training if needed. A one-hour virtual refresher session was given to each clinic one month after recruitment started. Each clinic had a unique login to access the platform.

Intervention

The ESOGER tool was developed in Quebec, Canada, by the McGill Centre of Excellence on Longevity [21]. ESOGER tool was created as a remote needs-assessment tool for older adults during the COVID-19 pandemic to facilitate connections between community organizations and older adults [24,31]. The tool provides a multidimensional assessment of patients' physical, mental, cognitive, and social health. Questions include COVID-19 symptoms and testing, number of medications, use of a walking aid, use of home care, informal and formal social support, level of anxiety, presence of cognitive impairment, difficulty accessing essential needs (food, medication, physical care), social contacts and social isolation [21]. The tool can be administered by phone through an online secure platform which generates a one-page report of the participant's vulnerabilities using color coding to indicate whether the participant is at low (green), moderate (orange) or at high (red) risk in each domain as well as an overall risk category (low, moderate, high) (see Multimedia Appendix 1). Questions associated with moderate or high-risk scores also appeared in the report. During the trial, there were no content changes. However, early on in the trial, a bug was detected in which questions related to moderate or severe vulnerability did not appear in the report, but was promptly corrected. The tool was available in English or French and freely accessible on the CEEXLO web-based platform using an electronic device such as a computer, tablet, or smartphone, but is no longer functional [21]. The complete description of the tool and its design can be found elsewhere [21].

Participants were randomized 1:1 to either the intervention or standard care group. Participants in the intervention group were administered the ESOGER tool by clinic staff at least one day before their consultation. Clinics received reminders to administer the ESOGER tool to upcoming research participants through email and Teams messages. The report generated by the tool was then placed in the participants' electronic medical record (EMR) and flagged in the EMR as a new document before the consultation. Participants in the standard care group continued to receive standard care during their consultation. For research purposes, they were also administered the ESOGER tool by a

research team member; however, the results from the tool were not communicated to the health provider. In both groups, a baseline questionnaire on sociodemographic characteristics and initial measurement of study outcomes was administered by phone by the research team (see Multimedia Appendix 2). A follow-up questionnaire (see Multimedia Appendix 3) on study outcomes was administered by phone by the research team three months following the participants' consultation with their primary care provider. Multiple attempts were made to reach participants who did not answer. Participants' responses to the baseline, ESOGER, and follow-up questionnaires were all entered into the secure web-based platform.

Study measures

The primary outcome was health-related quality of life (HRQoL) as measured by the EuroQol 5D (EQ-5D) [32]. The EQ-5D captures self-reported HRQoL outcomes in five domains (mobility, self-care, usual activities, pain/discomfort and anxiety/depression) on a 5-point scale (1 = no problem to 5 = severe problems). The answers to all 5 items produce a 5-digit vector representing a unique health state. Using a population-based value set for Canada, the 5-digit vector was transformed into a continuous measure ranging from 0 to 1, where 0 represents the worst health state and 1 represents "full health" [33]. The psychometric properties of the EQ-5D have been evaluated with older adults in several settings (self-administered, administered over the telephone) and have been found to be satisfactory [34–36].

The EQ-5D was chosen as the primary outcome as its domains aligned closely to those measured by the ESOGER tool and is among the most widely-used and validated patient-reported outcome measures (PROMS) which are increasingly recognized as a key patient-centered approach to measuring outcomes that matter most [37]. This outcome also aligned with previous literature evaluating the potential of pre-consultation tools [6,38–41]. We hypothesized that the use of the ESOGER tool report would allow providers to better address potential care needs (e.g medication review, anxiety management, social support) leading to an improvement in domains of the EQ-5D and therefore overall score. Secondary outcomes were self-reported unplanned (walk-in) visits to their family doctor, visits to the emergency department (ED) and hospitalizations within the last three months. These outcomes were selected to explore whether the use of the ESOGER tool would have an indirect effect on health service use through better primary care management in keeping with previous literature [42–45]. Potential pathways for this effect include enhanced communication between patient and healthcare providers [46,47], improved care planning [6,48], and more effective resource allocations [6]. Results of unplanned visits to the family doctor are not reported due to data

quality problems. . These outcomes align with previous literature that evaluate the potential of pre-consultation tools [6,38–41].

Sociodemographic characteristics were collected at baseline and included age, sex, born in Canada, self-identification as a visible minority, a member of an indigenous group (First nations, Métis or Inuit), living alone, owning place of residence and receiving a government income supplement. Age and the list of chronic conditions were collected by clinic staff from patient records at the time of recruitment. Chronic conditions were categorized according to the provincial public health insurance vulnerability codes[49]. Sex was determined primarily from patient records, with missing information completed using the self-reported baseline questionnaire. The omission of gender information was a deliberate decision, as both knowledge users and patient-partners on the research team believed that its inclusion might introduce confusion for participants. All other sociodemographic characteristics were collected through the baseline questionnaire.

Sample size and randomization

Assuming a 20% dropout rate based on prior experiences in practice-based research and on calculations for superiority trials, a total of 480 participants with 240 participants in each study arm was estimated to provide 80% power to detect a difference of at least 10% in the change in the EQ-5D score between the intervention and standard care group [50,51].

Consenting participants were individually randomized within blocks of size 10 and with an allocation ratio of 1:1 to receive ESOGER or standard care. Randomization was performed at the participant rather than the clinic level to promote buy-in by allowing all clinics to experiment with the tool, to provide cross-clinic comparisons of results as a benchmarking exercise for the clinics, as well as to promote statistical power. Given the awareness of the clinic staff administrating the ESOGER tool, clinics were not blinded to the group assignment. Participants were blinded at the time of assignment, but may have been unblinded if providers mentioned ESOGER during the consultation.

Statistical analysis

An intention-to-treat analysis was carried out for the study outcomes. A beta regression analysis was chosen for the primary outcome, the EQ-5D score. As recommended in the literature, this model was selected as the distribution of HRQoL tends to be highly left-skewed and bounded within the 0 and 1 interval [52]. The model included a term for treatment (intervention vs standard care), time and their

interaction. The effect of the tool was assessed based on the interaction term which tested for a difference in the change in the outcome between both groups. Moreover, as recommended in the literature, interpretation of the difference in EQ-5D values for the primary outcome were based on the minimal clinically important difference (MCID) for the EQ-5D [53]. Prior estimates of the MCID for the EQ-5D index score based on the Canadian scoring are commonly in the range of 4% to 7% [54]. The difference in EQ-5D values were calculated as the difference in the predicted EQ-5D score from pre to post, for both the intervention and the control group. A logistic regression was carried out for the secondary outcomes. Odds ratios and corresponding 95% confidence intervals were calculated for each model.

Inverse probability of censoring weighting was used to impute missing date due to censoring (loss to follow-up). To construct the weights, potential predictors of the probability of being censored were identified by comparing characteristics between participants with complete follow-up data and those censored as is recommended in the literature [55]. All characteristics with a standardized mean difference greater than 0.1 were considered as potential predictors [56,57]. The probability of being censored was modeled with a logistic regression and included the following predictors: clinic identification, age, sex, number of chronic conditions, feeling of having someone to count on, taking more than 5 medications a day, having help at home, using a walking aid, anxiety level, immigration status, hospitalization in last 3 months, ESOGER score for social health, ESOGER score for mental health, and ESOGER global frailty score. An analytical sample was created by removing censored participants and by weighting the remaining participants in the rest of the analysis for all outcomes [58]. The analytical sample excluded 10 additional participants whose data had too many missing values to calculate the weights [58].

Analyses and interpretations were carried out in accordance with the Consolidated Standards of Reporting Trials guidelines [59]. All analyses were carried out using R, version 4.1.2 [60].

Sensitivity analyses

Complete case, per-protocol, and as treated analyses were performed to verify the robustness of the results. For the complete case analysis, patients with missing data at the follow-up period were removed from the analysis. For the per-protocol, only individuals who adhered to the clinical trial instructions as specified in the study protocol were included. Participants in the intervention group whose ESOGER tool report was either not completed or not filed in the EMR in time for the consultation date were considered non-adherent. The as-treated analysis considered patients according to the actual treatment received, rather than the treatment to which they were assigned.

Additional sensitivity analyses were carried to consider the effect of clustering of participants within study clinics and were found to have no influence on study findings. Thus, for simplicity, model results are presented unadjusted for clustering.

Ethics approval

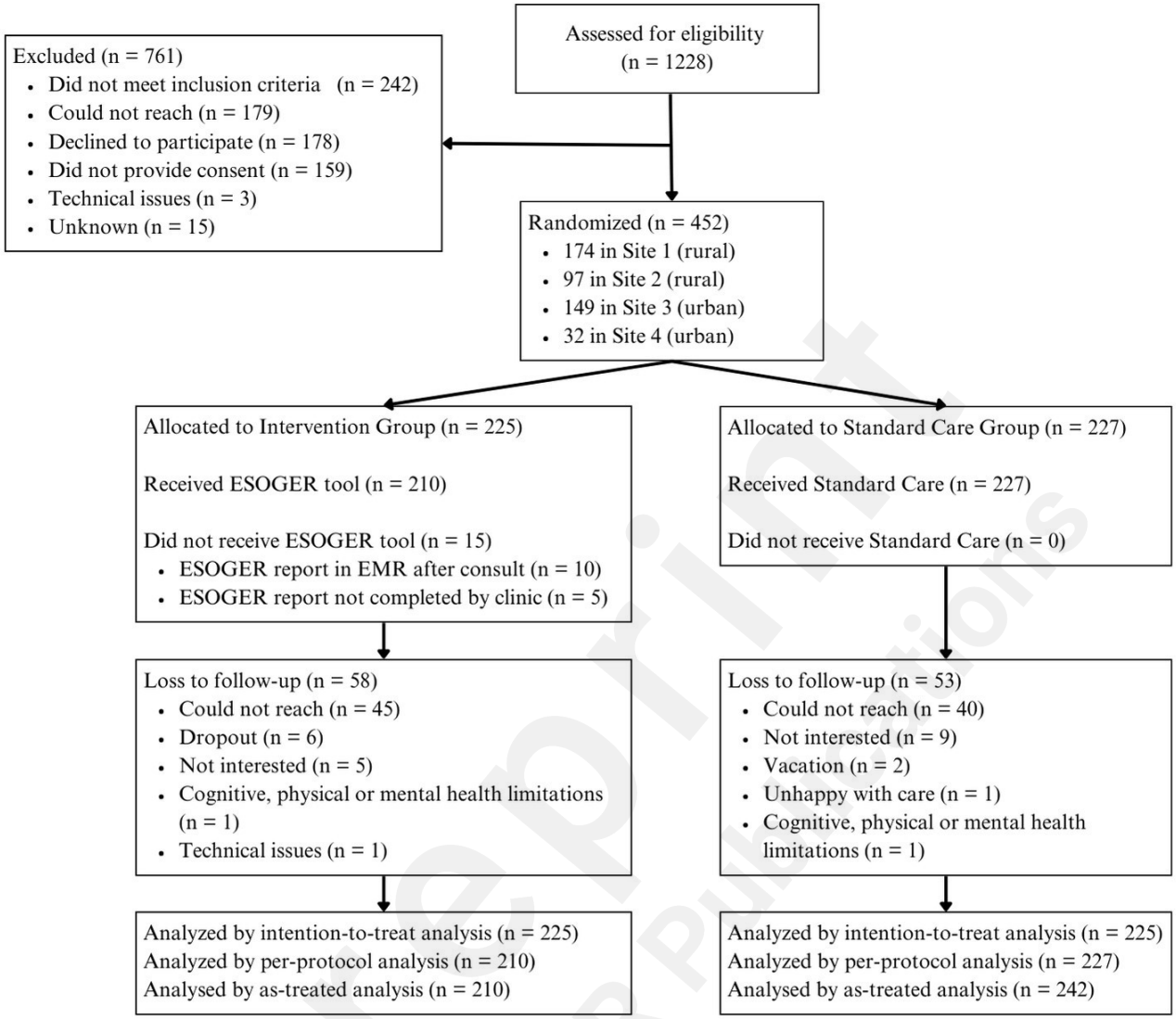
This study was approved by the Research Ethics Committee of the University of Montreal Hospital Research Centre (21.239).

Results

Participant Requirement and Characteristics

In total, 452 participants were enrolled in the study from December 2021 to July 2022, with 227 randomized to the standard care group and 225 to the intervention group (Figure 1).

Figure 1. The Consolidated Standards of Reporting Trials diagram.



Sociodemographic characteristics of participants are reported in Table 1. The mean age of participants was 75 years old (± 6.49), of which more than half were female (58.41%). Most of the participants were born in Canada (93.58%), with only 9.96% a visible minority, and only 1.33% a member of an indigenous group (First nations, Métis or Inuit). Less than half of the participants were living alone (34.07%), and were receiving a government income supplement (28.54%), while more than half owned their place of residence (60.18%). On average, patients had 0.98 (± 1.20) chronic conditions. The most prevalent chronic condition was diabetes (27.88%), followed by cardiovascular disease (19.47%), and generalized anxiety disorder and eating disorders (16.37%). Of the initial 452 participants, 111 (24.56%) were lost to follow-up.

Table 1. Participant's sociodemographic characteristics and vulnerabilities at baseline (N=452).

	Standard Care	Intervention (ESOGER[a])	Overall
	n = 227	n = 225	n = 452
Age (years)			
Mean (SD[b])	74.81 (6.2)	75.18 (6.7)	74.99 (6.5)
Median [Min[c], Max[d]]	73.48 [65.6, 95.6]	74.23 [48.0, 93.4]	73.81 [48.0, 95.6]
Missing, n (%)	2 (0.9)	4 (1.8)	6 (1.3)
Female, n (%)	137 (60.4)	127 (56.4)	264 (58.4)
Missing, n (%)	0 (0.0)	5 (2.2)	5 (1.1)
GMF			
Clinic 1, n (%)	87 (38.3)	87 (38.7)	174 (38.5)
Clinic 2, n (%)	49 (21.6)	48 (21.3)	97 (21.5)
Clinic 3, n (%)	74 (32.6)	75 (33.3)	149 (33.0)
Clinic 4, n (%)	17 (7.5)	15 (6.7)	32 (7.1)
Born in Canada, n (%)	207 (91.2)	216 (96.0)	423 (93.6)
Visible minority, n (%)	24 (10.6)	21 (9.3)	45 (10.0)
Is a member of an indigenous group, n (%)	4 (1.8)	2 (0.9)	6 (1.3)
Lives alone, n (%)	83 (36.6)	71 (31.6)	154 (34.1)
Missing, n (%)	0 (0.0)	13 (5.8)	13 (2.9)
Owns place of residence, n (%)	137 (60.4)	135 (60.0)	272 (60.2)
Missing, n (%)	12 (5.3)	22 (9.8)	34 (7.5)
Receives government income supplement, n (%)	64 (28.2)	65 (28.9)	129 (28.5)
Missing, n (%)	2 (0.9)	6 (2.7)	8 (1.8)
Number of chronic conditions, n (%)			
Mean (SD)	0.94 (1.1)	1.03 (1.2)	0.98 (1.2)
None, n (%)	57 (25.1)	56 (24.9)	113 (25.0)
One, n (%)	94 (41.4)	80 (35.6)	174 (38.5)
Two, n (%)	56 (24.7)	58 (25.8)	114 (25.2)
Three or more, n (%)	20 (8.8)	31 (13.8)	51 (11.3)
Diabetes, n (%)	56 (24.7)	70 (31.1)	126 (27.9)
Cardiovascular disease (cardiac insufficiency, severe hypertension, arteriosclerosis), n (%)	30 (13.2)	58 (25.8)	88 (19.5)
Generalized anxiety disorder and eating disorders, n (%)	42 (18.5)	32 (14.2)	74 (16.4)
Chronic obstructive pulmonary disease (COPD) and asthma, n (%)	27 (11.9)	21 (9.3)	48 (10.6)

Chronic inflammatory diseases, n (%)	18 (7.9)	11 (4.9)	29 (6.4)
Recurrent major depressive disorder, n (%)	10 (4.4)	14 (6.2)	24 (5.3)
Chronic renal failure, n (%)	4 (1.8)	12 (5.3)	16 (3.5)
Thrombogenic diseases, n (%)	5 (2.2)	7 (3.1)	12 (2.7)
Other chronic conditions[e], n (%)	12 (5.3)	11 (4.9)	23 (5.1)

[a]ESOGER: *Evaluation SOcio-GERiatrique*

[b]SD: Standard deviation

[c]Min: Minimum

[d]Max: Maximum

[e]for confidentiality, chronic conditions with a count of five or fewer were grouped into the category "Other chronic conditions”

Effect of the ESOGER tool on EQ-5D and unplanned health service use

Descriptive statistics for the study outcomes in both groups are reported in Table 2. The adjusted change in EQ-5D scores at three months was 0.015 in the intervention group and -0.002 in the standard care group, an increase of 1.97% and a decrease of 0.28%, respectively in both groups. These changes were found to be below the minimum recommended MCID threshold of 4% for meaningful change in the EQ-5D [46]. The net difference in EQ-5D comparing the intervention to the standard care group was 0.02. Regression analysis found no significant change in the EQ-5D score over the three-month period between the intervention and standard care group (OR = 1.1, 95% CI [0.9, 1.4]) (Table 3). No significant change in visits to the emergency department (OR = 1.3, 95% CI [0.6, 2.8]) or hospitalizations (OR = 2.4, 95% CI [0.8, 7.9]) between study groups was observed. Sensitivity analyses revealed similar findings using complete cases, per-protocol, and as-treated approaches (see Multimedia Appendix 4).

Table 2. Main and secondary outcomes at baseline and follow-up.

	Baseline		Follow up	
	Standard Care	Intervention (ESOGER[a])	Standard Care	Intervention (ESOGER[a])
	n = 227	n = 225	n = 174	n = 167
EQ-5D[b] Score				
Mean (SD[c])	0.8 (0.2)	0.8 (0.2)	0.8 (0.2)	0.8 (0.2)
Median [Min[d], Max[e]]	0.9 [0.2, 1.0]	0.86 [0.1, 1.0]	0.9 [0.2, 1.0]	0.87 [0.1, 1.0]
Visits to ED[f] in last 3 months				
Yes, n (%)	41 (18.1)	31 (13. 8)	20 (11.5)	24 (14.4)
Hospitalization in the last 3 months				
Yes, n (%)	19 (8.4)	20 (8.9)	5 (2.9)	12 (7.2)

[a]ESOGER: *Evaluation SOcio-GERiatrique*

[b]EQ-5D: EuroQol 5D

[c]SD: standard deviation

[d]Min: minimum

[e]Max: maximum

[f]ED: emergency department

Table 3. Beta regression results of the effect of receiving the ESOGER tool on 3-month study outcomes for older adults in the primary care setting (N = 341).

	[a]EQ-5D score		[b]ED visits in last 3 months		Hospitalization in last 3 months	
	[c]OR	*95% [d]CI*	*[c]OR*	*95% [d]CI*	*[c]OR*	*95% [d]CI*
Intercept	3.8	[3.4, 4.3]	0.2	[0.2, 0.3]	0.1	[0.1, 0.1]
3 months vs 0 months	1.0	[0.9, 1.2]	0.6	[0.4, 1.1]	0.34	[0.1, 0.8]
Intervention vs standard care	0.9	[0.8, 1.1]	1.0	[0.6, 1.6]	1.01	[0.5, 2.0]
Effect of time in the intervention versus standard care	1.1	[0.9, 1.4]	1.3	[0.6, 2.8]	2.4	[0.8, 7.9]

[a]EQ-5D: EuroQol 5D

[b]ED: emergency department

[c]OR: odds ratio

[d]CI: confidence interval

Discussion

Principal findings

This randomized controlled trial evaluated the effectiveness of ESOGER as a pre-consultation tool in improving health-related quality of life and unplanned health service use in older adults in the primary care setting. Three months after implementation of the ESOGER tool, no significant change was observed in the EQ-5D score, visits to the ED, and hospitalizations between the intervention and standard care group.

Comparison with other studies

This study adds to sparse literature on the effectiveness of pre-consultation tools to support the management of community-dwelling older adults in primary care. The ESOGER tool differs from other pre-consultation tools that focus on a single disease, since it provides a multidimensional assessment of health and social needs of older community-dwelling adults prior to the visit with the family physician [21]. Despite the potential of pre-consultations to support the care of older adults and improve patient outcomes, findings from this study were in line with other studies which showed no significant effect on quality of life, visits to the ED or hospitalizations. A recent randomized controlled trial on the electronic Patient-Reported Outcome (ePRO) tool, a pre-consultation tool for older adults used in the primary care setting, found a non-significant decrease in quality of life for patients [14]. Likewise, a rapid geriatric assessment (RGA) screening tool showed no significant reduction in ED reattendance and hospitalizations when studied in an emergency department [15].

First, the lack of observed impact on health-related quality of life may be partially due to a ceiling effect given the high levels of reported quality of life of participants [61]. This phenomenon was similarly reported for the ePro tool in which study participants started and remained relatively healthy throughout the course of the study, attenuating the potential for improvement [14]. Targeting more vulnerable older adults may provide further insight into the capacity of pre-consultation tools to yield benefit. Second, whether, and the extent to which providers utilized or discussed the ESOGER tool report with their patients during the consultation could also play a key role in the tool's ability to impact care. A recent report on physician learning found that physicians' increasing task load, the influx of medical information and tools, and the growing workforce shortage contribute to a sense of

feeling overwhelmed and to a lack of time to keep up to date on all patient-relevant information [62]. Thus, clinic working conditions including workforce shortage and time constraints of clinic of healthcare providers might have contributed to the limited effect on the outcomes. Study logistic constraints that led to the choice of a short follow-up time could also explain the lack of impact on outcomes. Moreover, patients in the standard care group may have potentially benefitted from receiving the ESOGER tool even though results were not shared with the clinic, further contributing to an attenuation of the effect observed. Indeed, as reported by Lussier et al. tools that promote patient activation can be advantageous for patients to prepare their medical visits[63]. Further, although identifying vulnerabilities in healthcare settings is an important first step, it is insufficient for improving health outcomes without a comprehensive care plan. The World Health Organization's Integrated care for older people (ICOPE) tool aims to identify vulnerabilities in community settings[64], yet its effectiveness in enhancing overall health outcomes remains unproven[65,66]. While ICOPE facilitates the identification of health issues, it has not demonstrated that merely recognizing these problems leads to improved health results. So, while patient, provider and system factors may partially explain the inability of the current and previous pre-consultations tools in improving outcomes, identifying a need does not necessarily lead to the system meeting the need [67].

Future directions

Several other avenues could be explored in future studies to improve upon and test the effectiveness of pre-consultation tools for older adults in the primary care. Further testing of the tool with a longer follow-up period may yield a more accurate assessment of the full potential of these tools, allowing for a ‘ramp-up’ period and increased awareness by providers and staff. Future research could consider implementation studies including the perspectives of patients and providers with the tool, whether the tool improves the care relationship, the care plan, and what actions might have been taken because of the tool. Coupling the implementation of pre-consultations tools with the use of systematic and comprehensive methods to assess information from the perspective of the information users, such as the Information Assessment Method (IAM) developed by Badran et al. (2017) may “allow clinicians to report the cognitive impact, clinical relevance, intention to use, and expected patient health benefits associated with clinical information”[68]. It would also be interesting to consider the addition of clinical notes to compare provider behavior with and without the use of a tool-based summary report. Given the limited resources and staff available within primary care clinics, determining an optimal strategy to deploy and use the tool bears further consideration.

Beyond targeting the patient population most likely to benefit from a pre-consultation assessment, determining the frequency of these assessments and the optimal mode of administration, whether self-administered online or conducted by phone, should aim to be feasible given the current pressure on primary care systems and workforce shortage. For example, the ESOGER tool could be used by nurses for pre-visit planning before consultations. Comparing patient and provider perspectives on the utility of such tools and their specific content may also provide additional insight. For example, the under detection of mental health and social issues within primary care in comparison to physical needs has been previously reported [69,70]. Pre-consultation tools that specifically target these overlooked aspects of patient care may provide more direct benefit to both patients and providers. Finally, the delineation of effective implementation strategies to foster widespread adoption and long-term sustainability of such tools remains an understudied area of research.

Limitations of the study

Several strengths and limitations of the study should be noted. This study is one of very few randomized trials studying the effectiveness of web-based pre-consultation tools and contributes to a sparse body of evidence. It employed rigorous methods throughout the trial and used advanced modeling techniques, notably, for the treatment of missing data. Blinding of the random assignment to clinics was, however, not feasible in this study and may have contributed to an attenuation of the effect. Patient chronic conditions was limited to what was documented in the patient chart, and therefore may be underestimated. There was a high number of participants who were lost to follow-up, yet inverse probability of censoring weighting was employed to minimize bias that may have resulted. Moreover, randomization at the patient rather than clinic level, while chosen to maximize power and buy-in, may have induced contamination between providers [71]. It should also be noted that study outcomes were patient-reported and thus subject to recall bias. Non-adherence to the intervention was present in the study, predominantly related to organizational factors, including oversight, errors or constraints leading to delayed completion of the report before the consultation. Nevertheless, sensitivity analyses found that results were robust to non-adherence. Due to logistic constraints, the study was also subject to a limited follow-up duration; consequently, the full potential of the ESOGER tool to influence study outcomes might not have been evident. While the study benefited from strong internal validity, external validity to other populations and jurisdictional contexts remains limited.

Conclusion

Although the effectiveness of ESOGER in enhancing health-related quality of life and reducing unplanned health service utilization among older adults in the primary care settings was not demonstrated in this study, our findings nevertheless contribute to a limited body of literature examining the impact of web-based pre-consultation tools on managing community-dwelling older adults in primary care. It remains, however, that web-based pre-consultation tools like ESOGER hold promise to support primary care providers in managing their older patients. Further research is needed to determine the conditions under which these tools may be useful and feasible for use in primary care.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Abbreviations

ED: emergency department
EMR: electronic medical record
ESOGER: *Evaluation SOcio-GERiatrique*
EQ-5D: EuroQol 5D
HRQoL: health-related quality of life
MCID: minimal clinically important difference
PROMS: patient-reported outcome measures
RCT: randomized controlled trial

Multimedia Appendix 1: Sample of report generated by ESOGER
Multimedia Appendix 2: Baseline questionnaire

Multimedia Appendix 3: Follow-up questionnaire

Multimedia Appendix 4: Sensitivity analyses

Multimedia Appendix 5: CONSORT-EHEALTH V1.6.

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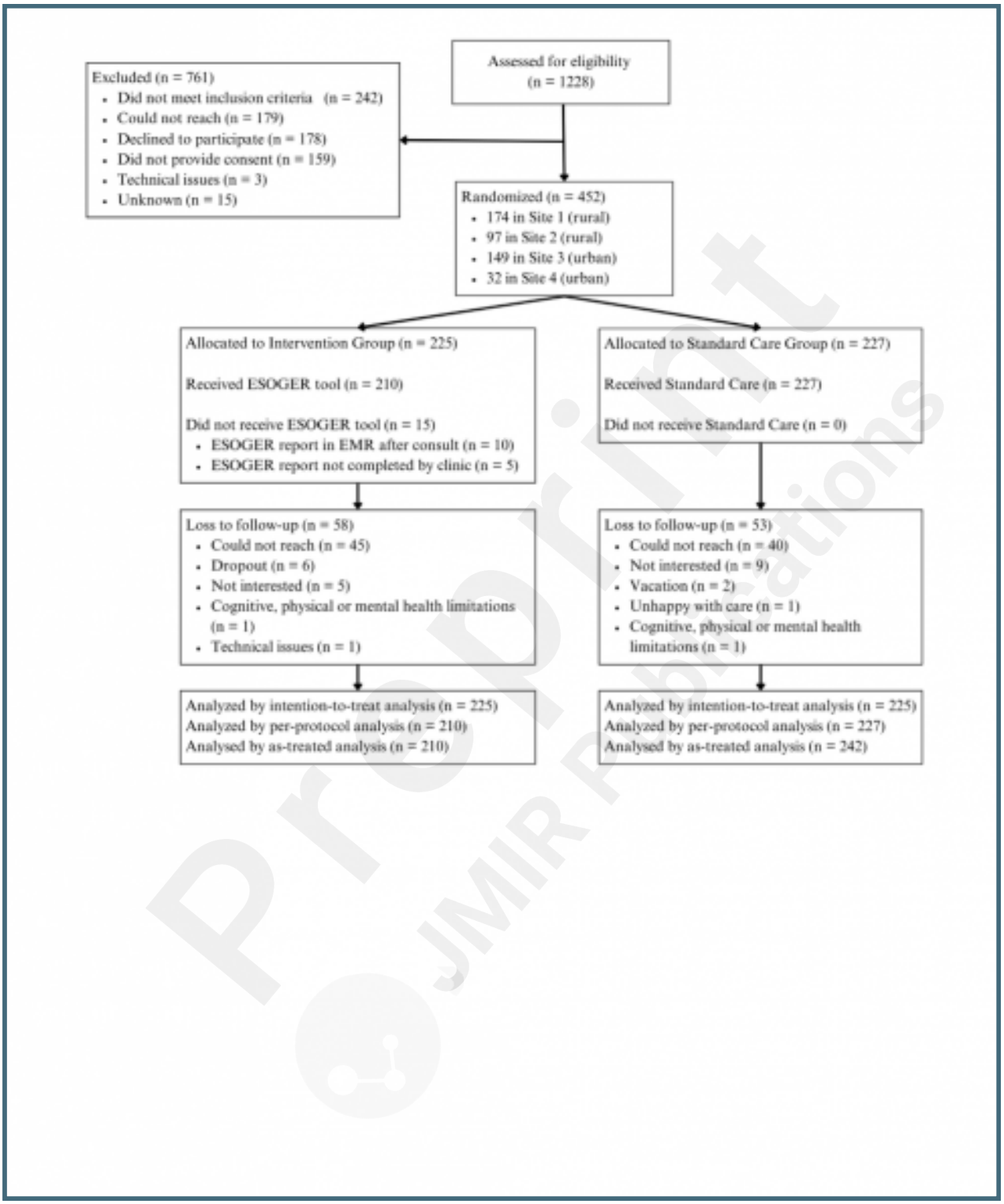
Supplementary Files

Figures

Consolidated standards of reporting trials diagram.



Multimedia Appendixes

ESOGER report sample.
URL: http://asset.jmir.pub/assets/eee838b74003460d0f46b32500750b10.pdf

Baseline questionnaire.
URL: http://asset.jmir.pub/assets/5884a1a59bfd48f1963083f9c1005365.pdf

Three-month follow-up questionnaire.
URL: http://asset.jmir.pub/assets/05bb4a17284348dfd7ae6450e60be4e5.pdf

Sensitivity analyses.
URL: http://asset.jmir.pub/assets/b0e10f95b95185c1cb8f1568964d2ad4.docx

Consort-EHEALTH V1.6.
URL: http://asset.jmir.pub/assets/b5bdb913ffc946de8badc5a71aacdd24.pdf