

# A Scoping Review for Strategies to Increase Living Kidney Donation

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## Abstract

**Background and objectives** The literature on strategies to increase the number of potential living kidney donors is extensive and has yet to be characterized. Scoping reviews are a novel methodology for systematically assessing a wide breadth of a given body of literature and may be done before conducting a more targeted systematic review.

**Design, setting, participants, & measurements** We performed a scoping review and summarized the evidence for existing strategies to increase living kidney donation.

**Results** Our review identified seven studies that tested interventions using rigorous methods (*i.e.*, randomized, controlled trials) and outcome measures, all of which focused on using education targeted at potential recipients to increase living donation. Of these, two studies that targeted the potential recipients' close social network reported statistically significant results. Other interventions were identified, but their effect was assessed through quasiexperimental or observational study designs.

**Conclusions** We identified an important gap in the literature for evidence-based strategies to increase living kidney donation. From the limited data available, strategies directed at potential recipients and their social networks are the most promising. These results can inform transplant programs that are considering strategies to increase living kidney donation and highlight the need for conduct of high-quality study to increase living donation.

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## Introduction

ESRD is a global health challenge and expected to reach epidemic proportions over the coming years (1–3). Kidney transplantation in eligible potential recipients is the preferred treatment for ESRD given improved patient outcomes and reduced health care costs compared with dialysis (4–6). However, transplantation is limited by the availability of donor kidneys (7,8). Many jurisdictions and programs have either implemented or are considering a variety of strategies to increase rates of kidney donation to meet the growing demand for kidney transplantation. Unfortunately, there is limited evidence and guidance on what effective strategies to increase kidney donation have the most promise.

Although living kidney donation (LKD) has superior outcomes for patient and graft survival (9) along with the potential to provide more kidneys for donation than deceased donation, it is underused in many kidney transplant programs. Furthermore, rates of LKD have become stagnant over the last 10 years in many countries, including the United States and Canada. Various strategies to increase the rate of LKD have been reported in the literature, including tax policies, cost reimbursement, educational interventions, and public campaigns. Despite the breadth of

literature reporting on these various strategies to increase donation, there is uncertainty about the effectiveness and feasibility of these options. A summary of strategies and their effect is needed by programs to inform deployment of strategies that are most likely to be effective.

A scoping review is a form of qualitative research methodology that facilitates the description of a diverse and complex body of literature (Table 1) (10). Scoping reviews outline what is known in existing research, while mapping the evidence in areas that are not well described, and they can be particularly useful in instances where not all possible interventions are known. Furthermore, scoping reviews explore the source, range, and nature of studies and may serve as the foundation for further systematic review (11). Given the current context of inadequate supply of kidneys for transplantation, stagnation in growth of LKD, and programs seeking to deploy strategies to increase LKD, we undertook a scoping review. Our objectives were to (1) outline the strategies that have been evaluated to increase the rates number of LKD, (2) map and describe the evidence available and the quality of the evidence, and (3) identify and guide future research priorities.

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**Table 1. Characteristics of scoping and systematic reviews**

Systematic Review	Scoping Review
A single research question with narrow focus	Encompasses broad research area or question(s)
Inclusion/exclusion criteria explicitly defined at outset	Inclusion/exclusion can be developed <i>post hoc</i>
Quality of identified studies important	Quality not an initial priority
Detailed data abstraction defined <i>a priori</i>	May or may not involve data extraction
Formal quantitative synthesis often performed	Synthesis descriptive and typically not quantitative
Results in a formal conclusion to the stated research question	Identifies gaps in a body of literature

Modified from ref. 10, with permission.

## Materials and Methods

### Search Strategy

We performed a scoping review of the literature to identify studies evaluating strategies to increase LKD. The search strategy was developed with the aid of a librarian (D.L.) experienced in both systematic and scoping reviews (Supplemental Material). Searches were conducted in PubMed, MEDLINE, EMBASE, PsychINFO, and CINAHL (the search strategy is in Supplemental Material); the gray literature was not systematically searched. Works published in peer-reviewed academic journals, doctoral dissertations, research reports, and conference papers were considered. Reference lists of included papers were searched to identify papers missed in electronic searches. The search was kept purposely broad to capture all possible strategies. To be included, studies had to report original data and investigate a strategy for increasing LKD. The scope of publications was narrowed to those reporting one or more of the following outcomes: number of living donors or donation rate, number of living donor evaluations, number of contacts with transplant center from potential living donors, number of potential donors identified, number of potential donors asked, number of potential recipients evaluated, discussion of living donation, stated intent to engage in living donation, and consideration of living donation. We excluded (1) nonhuman studies, (2) non-English studies, and (3) editorials/letters, with no date limit. Because strategies to increase LKD and deceased kidney donation differ in their approach, we also excluded studies on deceased kidney donation; a scoping review of deceased donation strategies will be presented separately.

### Study Selection

Two reviewers (L.B. and D.C.) screened the titles of all identified papers first by title and then by abstract followed by the screening of full-text papers (Figure 1). Discrepancies between the two reviewers were resolved by discussion with a third reviewer (S.K.).

### Data Extraction

The following information was extracted from all included papers: author, country of publication, year of publication, study design, population setting and type (potential recipients versus potential donors), intervention type, and outcome measure. All studies were assessed by hierarchy of directness and relevance of the study outcome (s). In addition to the above, the following results were

extracted: number of participants, results, direction of effect, and significance of results. An assessment of the quality of the paper was also done for all randomized, controlled trials (RCTs), non-RCTs, and interrupted time series using the Cochrane risk of bias tools as a guide (12,13).

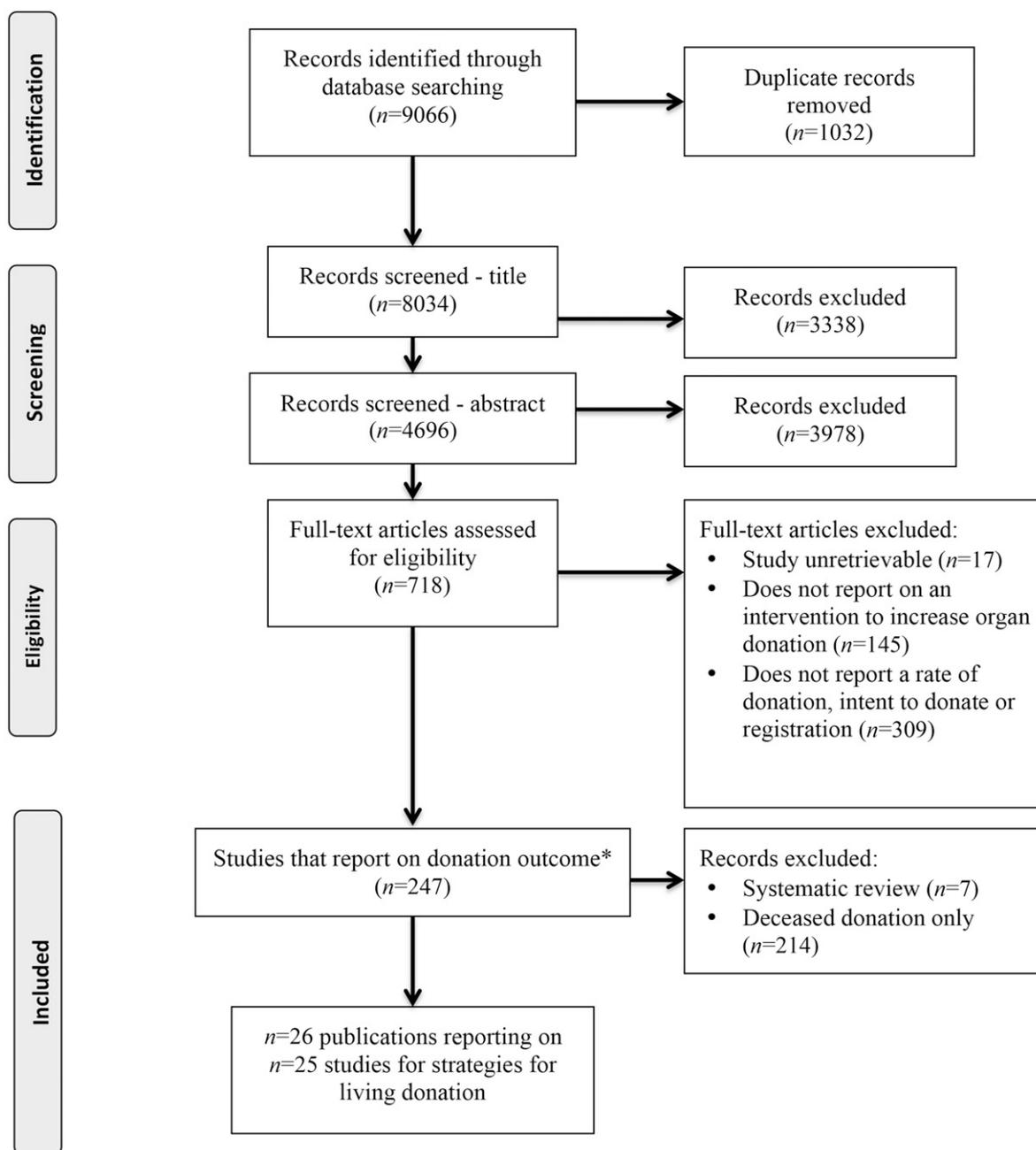
## Results

The search was conducted up to March of 2016. A total of 8032 records were screened, of which 26 were found to report on strategies to increase living donation and included one or more of the prespecified outcomes (Supplemental Table 1 shows a description of the studies). Of these 26 publications, two reported on the same study, and thus, 25 studies (in 26 publications) were included in this review (Figure 1).

### RCTs

Of the 26 publications identified, seven studies were RCTs that reported across nine outcomes (Table 2). All RCTs examined education-based interventions, with two of the studies targeting potential donors (14,15) and five of the studies targeting primarily potential recipients (16–20). Results from the RCTs varied across outcomes, despite examining similar education-based interventions.

Rodrigue *et al.* (16) and Ismail *et al.* (19) reported statistically significant increases in the number of living donors and the number of living donor evaluations (Table 2) (16,19). These two studies included an element of home-based education targeting the recipient and participants of their choice, such as family members or friends; furthermore, they were conducted on a directed individual level, providing individualized (one on one) rather than group education. In the work by Rodrigue *et al.* (16), clinic- plus home-based education resulted in 52% (33 of 63) and 30% (21 of 69) of patients on dialysis acquiring living donors in the intervention and control groups, respectively. Furthermore, 60% (38 of 63) and 35% (24 of 69) of intervention and control participants, respectively, had a living donor evaluated (16). The study by Ismail *et al.* (19) evaluated the delivery of a home-based educational intervention including two home visits, which resulted in 13 more living donors (intervention: 17 of 39, control: four of 41) and 18 more living donor evaluations (intervention: 25 of 39, control: seven of 41) (19).



\*donation outcomes included: living donor transplants, living donor evaluations, contacts to transplant center from potential donors, potential donors asked, potential donors identified, discussion of living donation, stated intent to engage in living donation

Figure 1. | Flow of studies.

The number of contacts with a transplant center from potential living donors varied among studies: two studies (Rodrigue *et al.* [21] and Ismail *et al.* [19]) reported a statistically significant increase, and one study (Barnieh *et al.* [18]) reported a positive increase, although it was not statistically significant.

Of the remaining outcomes (potential donors asked, potential donors identified, discussion of living donation, and stated intent to engage in living donation), none

reported statistically significant findings, although there were positive trends toward the number of potential donors identified, the number of potential recipients evaluated, and discussion of living donation. In the work by Pradel *et al.* (17), an educational intervention aimed at potential recipients had a negative effect on number of potential donors asked by the potential recipient, although this result was not statistically significant.

**Table 2. Results and risk of bias by outcome for RCTs (all education intervention strategies)**

Ref.	No. of Participants		Outcomes		Direction of Effect	P Value	Random Sequence Generation	Allocation Concealment	Blinding of Outcome Assessment	No Incomplete Outcome Data	No Selective Reporting
	Intervention	Control	Intervention	Control							
<b>No. of living donor transplants</b>											
Rodrigue <i>et al.</i> (16)	63	69	33	21	+	0.01	?	?	?	X	?
Ismail <i>et al.</i> (19)	39 <sup>b</sup>	41 <sup>b</sup>	17	4	+	0.003	✓	✓	✓	✓	✓
<b>No. of living donor evaluations</b>											
Rodrigue <i>et al.</i> (16)	63	69	38	24	+	0.005	?	?	?	X	?
Ismail <i>et al.</i> (19)	39	41	25	7	+	<0.001	✓	✓	✓	✓	✓
<b>No. of contacts with transplant center from potential living donors</b>											
Barnieh <i>et al.</i> (18)	50	50	4	2	+	>0.05	✓	✓	✓	✓	✓
Rodrigue <i>et al.</i> (16)	63	69	52	44	+	0.02	?	?	?	X	?
Ismail <i>et al.</i> (19)	39 <sup>b</sup>	41 <sup>b</sup>	29	13	+	<0.001	✓	✓	✓	✓	✓
<b>No. of potential donors asked</b>											
Pradel <i>et al.</i> (17)	107	107	26	35	—	NR	✓	?	?	✓	?
<b>No. of potential donors identified</b>											
Boulware <i>et al.</i> (20) <sup>c</sup>	43	44	12	10	+	>0.05	✓	✓	?	✓	✓
<b>Discussion of living donation</b>											
Pradel <i>et al.</i> (17)	107	107	57	53	+	NR	✓	?	?	✓	?
Boulware <i>et al.</i> (20)	43	44	20	11	+	0.05	✓	✓	?	✓	✓
<b>Stated intent to engage in living donation</b>											
Piccoli <i>et al.</i> (14)	808	659	595	485	=	NR	?	?	?	X	?
Thornton <i>et al.</i> (15)	443	509	96% <sup>a</sup>	97% <sup>a</sup>	=	NR	?	?	?	?	?

+ , positive direction of effect in favor of the intervention; ? , unclear risk of bias; X , high risk of bias; — , negative direction of effect in favor of the intervention; NR , not reported; = , means that there is no difference in the direction of effect between the two groups.

<sup>a</sup>Only proportion reported.

<sup>b</sup>Population after censoring for death and deceased donor transplant.

<sup>c</sup>Intervention without social worker.

Although the assessment of quality of studies is not an explicit objective in scoping reviews, we explored the variation in quality across outcomes in the included RCTs (Table 2). The risk of bias was highest for studies that reported the number of living donors ( $n=2$ ) and the number of living donor evaluations ( $n=2$ ; same studies as previous studies); it was lowest for the number of potential donors identified ( $n=1$ ) and the number of recipients evaluated ( $n=1$ ). It was difficult to assess the quality across the studies reporting on remaining outcomes given key missing information within the reporting of the studies.

### Quasiexperimental Studies

Quasiexperimental studies were studies that were experimental in nature but lacking random assignment. Six articles (Table 3) were quasiexperimental studies, including controlled before and after or interrupted time series (22–27). Unlike RCTs, the strategies to increase donation varied and included education ( $n=1$ ), campaign ( $n=1$ ), removal of disincentives (donor reimbursement, leave policies, and tax benefits;  $n=3$ ), and an intervention that examined the effect of a web-based survey to enable screening of potential donors by providing an immediate response regarding the potential donor's candidacy. These interventions were aimed at the general population, potential donors or recipients, or the health system.

Outcomes reported for quasiexperimental studies included the number or rate of living donors ( $n=5$ ), the number of living donor evaluations ( $n=2$ ), the number of contacts with the transplant center from a potential donor ( $n=1$ ), and a stated intent to engage in living donation ( $n=1$ ) (Table 3). The only intervention that resulted in a significant increase in the number or rate of living donors was a structured educational program for potential recipients and their families (22).

Among the other interventions identified in quasiexperimental studies, three examined removal of disincentives (24–26); although all three found a positive trend toward increasing living donors, none of the studies reported statistically significant differences. One study reported on a novel web-based intervention for potential donors to self-screen themselves as candidates (27). They found that a web-based tool significantly increased the number of contacts with the transplant center; the study also found an increase in the number of living donors and living donor evaluations but did not report whether these findings were significant.

Quality across outcomes was mixed. It was difficult to determine the risk of bias in quasiexperimental studies for the outcome of number or rate of living donors due to missing information in one study that reported on several interventions. For the number of living donor evaluations and the number of contacts with the transplant center from living donors, the risk of bias was assessed to be low.

### Observational Studies

Of the 26 publications (25 studies) identified in the scoping review, the remaining 13 studies were observational studies (Table 4). Strategies in the observational studies included living donor pool exchange programs (28–31) ( $n=4$ ), education (32,33) ( $n=2$ ), creation of an

interdisciplinary team (34,35) ( $n=2$ ), prohibiting the reimbursement for transplantations performed in countries contravening the Declaration of Istanbul (36,37) ( $n=2$ ), use of a donor champion to facilitate the donation process (38) ( $n=1$ ), presumed consent (39) ( $n=1$ ), and establishment of a living donor ABO-incompatible program (40) ( $n=1$ ).

Of the 13 observational studies, 12 reported a number or rate of living donors. Of these, five reported a significantly positive increase in the number or rate of living donors, six reported a trend toward a positive increase (significance testing not reported), and one reported a negative statistically significant outcome. This latter study examined the effect of presumed consent (a policy for deceased donation) on living donation rates across 53 countries (39). Studies that reported significant increases in the number or rate of living donors included the interventions examining living donor promotion programs, education for preemptive transplantation, use of a live donor champion—a friend, family member, or community member who advocates for the transplant candidate in the living donation process, and laws that prohibited reimbursement for recipients getting transplanted in countries that did not adhere to the Declaration of Istanbul.

Other outcomes that reported significant results included the effect on the number of living donor evaluations using a live donor champion. These evaluations were ongoing at time of data analysis and could have potentially turned into living donor transplants, which would have increased the total number of living donor transplants to seven (of 15 participants) in those with a living donor champion compared with zero in the control group.

Assessment of the quality of studies in observational studies was not done, because these study designs have inherently high risk of bias and because quality is difficult to assess objectively.

### Discussion

This scoping review highlights gaps in knowledge on the effect of various strategies to increase LKD. We found that, of the various strategies that have been considered to increase LKD, very few strategies have been evaluated using a high-quality study design (such as RCT; even quasiexperimental studies were limited); many also used surrogate or intermediate outcomes to assess the effect on increasing donation. The only strategy formally tested (*i.e.*, using an RCT design) was education, and within this, outcomes varied, with only two of the seven studies reporting statistically significant increases in the number of living donors and living donor evaluations. It should be noted that both of these studies targeted not only the recipient but also, the recipient's close social network, such as family members and friends, and they were done on an individual basis, indicating a more direct approach to potential donors.

Although living kidney donor transplantation is cost saving compared with dialysis therapy, deploying finite resources to interventions that have minimal or no effect on the rate of living donation is unwise. As programs implement strategies to increase donation, given the lack of evidence, these strategies should be implemented within a robust evaluation framework to determine effectiveness.

Study Intervention	No. of Participants		Outcomes		Direction of Effect	P Value	Selection of Participants	Comparability of Groups	Exposure	Assessment of Outcome	Follow-Up	Summary Risk of Bias
	Experimental	Control	Experimental	Control								
<b>No. or rate of living donors</b>												
Boulware <i>et al.</i> (24): remove disincentives	27 States		2.39 <sup>a</sup>	1.68 <sup>a</sup>	+	>0.05	✓	✓	✓	✓	✓	Unclear
Venkataramani <i>et al.</i> (25): remove disincentives	16 States		2.64 <sup>b</sup>	2.47 <sup>b</sup>	+	0.65	✓	✓	✓	✓	X	
Chatterjee <i>et al.</i> (26): education	42 States <sup>c</sup>		5% <sup>d</sup>	NR	+	0.07	✓	X	✓	✓	?	
Chatterjee <i>et al.</i> (26): leave, public employer	42 States <sup>c</sup>		8% <sup>d</sup>	NR	+	0.06	✓	X	✓	✓	?	
Chatterjee <i>et al.</i> (26): leave, private employer	42 States <sup>c</sup>		8% <sup>d</sup>	NR	+	0.91	✓	X	✓	✓	?	
Chatterjee <i>et al.</i> (26): tax benefit	42 States <sup>c</sup>		4% <sup>d</sup>	NR	+	0.17	✓	X	✓	✓	?	
Moore <i>et al.</i> (27): web-based screening	1200		76	54	+	NR	✓	✓	✓	✓	✓	
Schweitzer <i>et al.</i> (22): education	NR	NR	NR	NR	+	0.02	✓	?	✓	✓	✓	
<b>No. of living donor evaluations</b>												
Moore <i>et al.</i> (27): web-based screening	1200		249	186	+	NR	✓	✓	✓	✓	✓	Low
Schweitzer <i>et al.</i> (22): education center from potential living donors	NR	NR	39.4%	33.4%	+	0.03	✓	?	✓	✓	✓	
Moore <i>et al.</i> (27): web-based screening	1200		116 <sup>e</sup>	61 <sup>e</sup>	+	<0.001	✓	✓	✓	✓	✓	Low
<b>Stated intent to engage in living donation</b>												
Alvaro <i>et al.</i> (23): campaign	405	419	NR	NR	=	NR	?	?	?	?	?	Unclear

✓, low risk of bias; X, high risk of bias; NR, not reported; +, =, means that there is no difference in the direction of effect between the two groups.

<sup>a</sup>Annual increase in donations per 100,000.

<sup>b</sup>Number of living donations per 100,000.

<sup>c</sup>Includes the District of Columbia.

<sup>d</sup>Change in living donors per capita.

<sup>e</sup>Number of contacts per month.

Table 4. Results by outcome for living donor observational studies

Reference	Description of Results	Direction of Effect	P Value
<b>No. or rate of living donors</b>			
Kwak <i>et al.</i> (28): exchange program	Over the study period of 6 yr, an increase of 61 living donors ( $n=411$ ) with introduction of exchange program	+	NR
Park <i>et al.</i> (29): exchange program	Over the study period, an increase from 2.2% (four of 180) to 31% (38 of 86) of living donor transplants with introduction of exchange program	+	NR
Roodnat <i>et al.</i> (30): exchange program	Over the study period, an increase of 35 donors ( $n=581$ ) with the introduction of exchange program	+	NR
Cole <i>et al.</i> (31): exchange program	Over the study period, an increase of 158 donors ( $n=2219$ ) with the introduction of exchange program	+	NR
Fonouni <i>et al.</i> (34): multidisciplinary team	Over the study period, an increase of 48% in living donors (from 18 to 42) with multidisciplinary team	+	NR
González Monte <i>et al.</i> (32): promotion program	An increase in the rate of donation from 0.8% (16 of 1964) to 4.4% (45 of 1022) through a living donor promotion program	+	<0.01
Cankaya <i>et al.</i> (33): education	More preemptive living donations in the education group (26 of 61) than the noneducation group (five of 27)	+	<0.001
Bendorf <i>et al.</i> (39): presumed consent	A decrease in living donor kidney rates of 8.7 pmp in countries with presumed consent	-	0.003
Cardinal <i>et al.</i> (35): multidisciplinary team	An increase from 50 to 73 in number of living donors (incident rate difference, 0.029; 95% CI, 0.00 to 0.06) with the creation of a multidisciplinary team	+	NR
Garonzik-Wang <i>et al.</i> (38): living donor champion	More living donors in the living donor champion group (four of 15) than in the control group (zero of 15)	+	<0.001
Lavee <i>et al.</i> (36): law to prevent transplant tourism	An increase in the number of living donors from 71 to 117 after enactment of law	+	0.003
Boas <i>et al.</i> (37): law to prevent transplant tourism	An increase in the number of living donors from 211 (prelaw) to 364 (postlaw)	+	<0.001
<b>No. of living donor evaluations</b>			
Garonzik-Wang <i>et al.</i> (38): living donor champion	More living donor evaluations in the living donor champion group (three of 15) than in the control group (zero of 15)	+	<0.001
Romagnoli <i>et al.</i> (40): ABO-incompatible program	An increase of 15% (12 of 78) in living donor evaluations with introduction of ABO-incompatible program	+	NR
<b>No. of contacts with transplant center from potential living donors</b>			
Cardinal <i>et al.</i> (35): multidisciplinary team	An increase in the number of contacts from 191 to 304 (incident rate difference, 0.143; 95% CI, 0.09 to 0.20) with the creation of a multidisciplinary team	+	NR
<b>Discussion of living donation</b>			
Garonzik-Wang <i>et al.</i> (38): living donor champion	Increased comfort of approaching a family member in the living donor champion group	+	0.07

+, indicates a positive direction of effect in favour of the intervention; NR, not reported; pmp, per million population; 95% CI, 95% confidence interval.

Many of the interventions in this review seem promising; however, the sample sizes were small, and further evidence is needed.

This scoping review can guide decision making on policies and strategies that should be considered by outlining the scope and general effectiveness of candidate strategies. However, the most promising strategy of education by a health care professional that targets the recipient and their social network is relatively resource intensive compared with more commonly used passive education or group learning. Although likely cost effective, given the significant resources required, conducting a formal cost-effectiveness analysis would be prudent.

Quasiexperimental studies included more varied interventions, including removing disincentives, which has been discussed widely elsewhere in the literature (41–43). Removing disincentives was not found to significantly increase the number of living donors, although these studies largely examined primary tax benefits at a state-wide level and not at an individual level.

Observational studies encompassed the most varied of strategies, but the interpretation of these study designs is challenged by the low quality inherent in this study design and minimal reporting of factors that could potentially affect study quality. Some novel interventions show promise and should be further tested: they include the use of a multidisciplinary team and the use of a live donor champion to help the patient navigate through the process of living donation. This latter intervention is another example of a directed approach at the recipient toward increasing living donors.

It is worth mentioning that some novel interventions were identified in this review. One such intervention was the use of a web-based self-screen tool that significantly increased the number of contacts with the transplant center. This study, however, did not find that these contacts led to an increase in the number of living donor transplantations.

Our review has identified a gap in the literature of evidence-based strategies to increase living donation. Despite the necessity to increase the number of living donors through any given strategy, the number of studies identified is relatively small. Furthermore, only education was assessed using the most unbiased study design of an RCT. Although an RCT may not be feasible to study all interventions, it could be applied to study donor champions or multidisciplinary teams—two interventions identified as increasing the number of donors. The lack of clear evidence of effectiveness of most of these strategies should be an impetus to rigorously study new initiatives to increase living donation, which may allow higher-quality study designs (cluster RCT, stepped wedge, *etc.*) than *post hoc* observational studies.

Our study has limitations. It is possible that our review missed some relevant studies due to the broad scope of the search strategy and the expectation to retrieve and screen all relevant studies. Furthermore, we limited our included studies to those that reported a rate or percentage increase in any of our included outcomes (inclusion of a denominator). Many studies were excluded that reported absolute numbers under a given strategy with no reference to the relative increase of the given strategy. Excluding these

studies allowed us to focus on studies in which the true effect of a strategy could be assessed. We also excluded non-English studies. Strategies being used in non-English-speaking countries may not have been reported in the English literature. A scoping review is not intended to be as exhaustive or comprehensive as a systematic review: it is a challenge in a scoping review to strike a balance between the breadth and depth of analysis. Although other strategies to potentially increase living donation were reported in the literature and identified through our review, we limited included studies to those with a measurable increase in one of the specific *a priori* outcomes deemed to be a reasonable indicator of effectiveness; arguably, excluded studies with less relevant outcome measures would not inform decision making. A limitation of scoping reviews is that there is no quantitative summary of the pooling of the results or formal summary of the quality of included studies. Given the heterogeneous results and the limited findings, pooling the results as a systematic review would not have been possible.

In conclusion, recognizing that the limitations of the evidence base that we identified in this scoping review preclude firm conclusions on optimal strategies to increase LKD, we believe that further research is urgently required. Strategies to increase living donation, whether implemented at a local, regional, or national level, should include a rigorous evaluative component embedded into the deployment with attempts to minimize bias and account for temporal trends; at a minimum, quasiexperimental study designs reporting on living donor outcomes should be considered. Our review excluded a significant number of interventional studies that did not report on living donor rates ( $n=309$ ). Because many of the commonly used outcome measures are quality metrics that most programs already capture, determining the effectiveness of deployed strategies should be feasible, even in busy transplant programs.

Specific interventions in living organ donation that may be promising and warrant further study are those that facilitate donor identification and engagement. Targeted strategies that overcome barriers faced by recipients in approaching or finding potential donors should be tested and may include elements of interventions identified in this scoping review, including educational initiatives that specifically target recipient family and friends, donor champions, patient navigators, and novel approaches to donor identification, such as social media strategies. It is possible that patients with factors that are difficult to modify that may negatively affect donor availability, identification, and engagement, such as cultural differences, lack of secure employment, poor supportive social networks, low socioeconomic status, and low health literacy, may require more intensive strategies to have an effect. The effect of these barriers on the conversion from potential to actual donors should also be examined.

LKD is the best option for eligible transplant candidates, and transplant programs and jurisdictions are seeking strategies to increase the currently stagnant living donation rate. Our scoping review indicates a paucity of high-quality studies showing effectiveness of various strategies to address this shortage. Recipient-based education that reaches family and friends has the best evidence of being effective. Implementation of unproven strategies should be performed with an evaluative component to assess their effect.

There is a critical need for high-quality studies to advance the evidence base and provide guidance to policymakers to achieve this goal; we outlined a few possible suggestions that would guide research and program evaluation. Our scoping review may be particularly useful to guide regional, provincial, or national organizations and decision makers in determining which, of the many strategies that may be used to increase living donation, should be considered.

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#### Disclosures

None.

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