



How does performance-based financing affect health workers' intrinsic motivation? A Self-Determination Theory-based mixed-methods study in Malawi



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ABSTRACT

“Intrinsic motivation crowding out”, the erosion of high-quality, sustainable motivation through the introduction of financial incentives, is one of the most frequently discussed but yet little researched potential unfavorable consequence of Performance-based Financing (PBF). We used the opportunity of the introduction of PBF in Malawi to investigate whether and how PBF affected intrinsic motivation, using a mixed-methods research design theoretically grounded in Self-Determination Theory (SDT). The quantitative component served to estimate the impact of PBF on intrinsic motivation, relying on a controlled pre- and post-test design, with data collected from health workers in 23 intervention and 10 comparison facilities before (March/April 2013; n = 70) and approximately two years after (June/July 2015; n = 71) the start of the intervention. The qualitative component, relying on in-depth interviews with health workers in selected intervention facilities one (April 2014; n = 21) and two (September 2015; n = 20) years after the start of PBF, served to understand how PBF did or did not bring about change in intrinsic motivation. Specifically, it allowed us to examine how the various motivation-relevant elements and consequences of PBF impacted health workers' basic psychological needs for autonomy, competence, and relatedness, which SDT postulates as central to intrinsic motivation. Our results suggest that PBF did not affect health workers' overall intrinsic motivation levels, with the intervention having had both positive and negative effects on psychological needs satisfaction. To maximize positive PBF effects on intrinsic motivation, our results underline the potential value of explicit strategies to mitigate unintended negative impact of unavoidable design, implementation, and contextual challenges, for instance by building autonomy support activities into PBF designs.

1. Introduction

Performance-based financing (PBF) currently receives much attention in low- and middle income countries (LMIC) as a means to strengthen effectiveness and efficiency of healthcare service provision. PBF aims to improve utilization and quality of healthcare services by motivating healthcare providers to better align their service provision behavior with health system interests. This is done through performance contracts which financially reward the attainment of defined performance standards while simultaneously improving facilities' decision autonomy on financial and productive resources (Renmans et al., 2017). Performance is monitored through close supervision and external verification. Facilities are ideally completely autonomous in how to spend their PBF surplus, although most current PBF schemes

prescribe that revenues generated through PBF are to be partially re-invested into the facility, and partially available for bonus payments to staff members (Fritsche et al., 2014). The wish for such additional income is thought to motivate health facilities and their staff to align service provision with health system interests and guidelines.

There are concerns that PBF might inadvertently undermine health workers' inherent willingness to perform well (“intrinsic motivation”) (Ireland et al., 2011). This is referred to as “intrinsic motivation crowding out”. Experimental research in non-healthcare settings conducted by psychologist and economists since the 1970s shows that crowding out of intrinsic motivation through performance-contingent financial incentives is possible under certain conditions (Deci et al., 1999). The literature further underlines that such intrinsic motivation crowding out could have unfavorable effects considering that intrinsic

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forms of motivation have consistently been shown to be superior to other forms of motivation with regards to performance and other important work-related outcomes (Gagné and Deci, 2005; Miquelon and Vallerand, 2008).

It is unclear to which extent this body of research applies to LMIC healthcare settings and PBF schemes, and whether concerns about crowding out of intrinsic motivation by PBF are therefore substantiated. In the literature and discourse around how and why PBF effects change, the individual financial incentive component dominates, but there is increased recognition and evidence that PBF is a much more complex reform package (Renmans et al., 2017). Specifically, PBF not only includes reward payment activities, but also necessitates performance contracts and verification and usually includes various other elements aimed at strengthening health system functions and promoting results orientation, such as a strengthening of performance monitoring, feedback systems and management structures, or capacity building measures (Renmans et al., 2016; Witter et al., 2013). Experiences across different PBF schemes indicate that PBF has the potential to positively change health workers' work realities in ways which might actually help them act on existing intrinsic motives rather than crowd out intrinsic motivation. For instance, in Benin, PBF strengthened various health system functions such as supervision and resource supply (Paul et al., 2017). Similarly, in Nigeria, health workers spoke of important improvements in their working conditions, and in consequence in their performance, which they experienced as very motivating and satisfying (Bhatnagar and George, 2016). In Malawi, PBF had transformed health workers' working environments in various positive ways, for instance by increasing the availability of equipment and supplies, introducing clear performance objectives, and strengthening supervisory structures (Lohmann et al., 2018). In light of these and other experiences, arguments can also be made that PBF does not erode, but rather supports and fosters intrinsic motivation overall ("crowding in"; Lohmann et al., 2016).

To our knowledge, to date, only three studies have explicitly investigated the impact of PBF on health workers' intrinsic motivation in LMIC, with results suggesting that intrinsic motivation might have been crowded out by the respective PBF interventions at least to some extent (Aninanya et al., 2016, in Ghana; Dale, 2014, in Afghanistan; Huillery and Seban, 2014, in the Democratic Republic of Congo). Unfortunately, none of these studies included an explanatory component. Further research is therefore urgently needed to understand how PBF interventions act on intrinsic motivation and can be designed in a way to preserve or even foster rather than erode important pre-existing motivational capacities.

Against this background, we used the opportunity of the introduction of PBF in Malawi, the Results-Based Financing for Maternal and Newborn Health (RBF4MNH) Initiative, to estimate the impact of PBF on intrinsic motivation, and to explore how and why PBF did or did not bring about change, using a mixed-methods research design theoretically grounded in Self-Determination Theory (SDT; Ryan and Deci, 2017). In alignment with our above-outlined understanding of PBF as a complex intervention package, in which financial rewards constitute one of several elements, we did not attempt to isolate the effects of the individual rewards, but rather investigated RBF4MNH's impact on intrinsic motivation in a holistic way.

1.1. Conceptual framework

Our understanding of intrinsic motivation is grounded in Self-Determination Theory (Ryan and Deci, 2017). At the heart of SDT is the idea that a sense of volition in one's behavior and a congruency of behavior with own values, goals and needs is central to individual wellbeing, well-functioning, and growth. In particular, SDT considers the fulfillment of three fundamental psychological needs as central. In the context of work, the need for autonomy refers to the desire to endorse and believe in one's actions at work, and to be able to act

according to one's beliefs and professional opinions, within professional borders. The need for competence refers to the inherent desire to do well and feel effective in one's job. The need for relatedness refers to a desire for successful, respectful, and caring interpersonal relationships and interactions at work.

SDT posits that people are naturally inclined to perform behavior which they find inherently enjoyable or which contributes to the fulfillment of the basic psychological needs. Such behavior is termed "autonomously motivated". SDT's autonomous motivation is very closely related to what is commonly understood as intrinsic motivation in the public health and economics literature and discourse (e.g. Leonard et al., 2013; Romaniuc, 2017): a willingness to act resulting from inherently satisfying characteristics or consequences of behavior, not necessitating specific external inducement. In this study, we operationalize intrinsic motivation as autonomous motivation, and use the terms interchangeably throughout the text.

SDT-based research from a vast range of domains and settings has demonstrated that basic needs satisfaction determines autonomous motivation, and has consistently related autonomous motivation to better work performance and other important work outcomes such as higher job satisfaction, organizational commitment, and well-being, compared to non-autonomous motivation (Gagné and Deci, 2005). Autonomous motivation has also been found more robust and stable over time than non-autonomous motivation. The SDT-based literature therefore underlines the importance of preserving and fostering autonomous motivation in the introduction of PBF and other interventions.

With the concept of basic needs satisfaction, SDT offers an explanatory framework of how and why external interventions aimed at behavior change impact autonomous motivation. As a complex external stimulus, PBF is likely to alter health workers' objective and subjective work realities and work behaviors in numerous needs-supportive but possibly also needs-thwarting ways. Depending on health workers' perceptions of and experiences with the specific intervention design, implementation, and results, and the extent to which these positively or negatively affect basic needs satisfaction, PBF might therefore both crowd in and crowd out autonomous work motivation (Lohmann et al., 2016).

1.2. Our prior work on the motivational effects of RBF4MNH

In a previous publication, we described the motivational mechanisms of RBF4MNH in detail (Lohmann et al., 2018). RBF4MNH motivated health workers to improve their performance by acting as a wake-up call to previous substandard performance; by providing direction and goals to work towards; by strengthening perceived ability to do well at work; by making health workers feel more recognized in their work; by triggering motivating changes in social dynamics at work; and by providing an opportunity to earn additional income. At the same time, various challenges were identified which negatively impacted motivation, thereby attenuating RBF4MNH's potential motivating effect. Such challenges included overly ambitious targets given low staffing levels and persisting shortages in drugs and supplies, perceived unfairness of the verification process, and diverse frustrations and interpersonal conflict related to the amount and use of the PBF reward payments.

This article builds directly on this previous work, analyzing through a Self-Determination Theory lens how the various positive and negative motivational mechanisms of RBF4MNH affected the satisfaction of the basic needs for autonomy, competence, and relatedness, to explain how and why RBF4MNH did or did not impact autonomous motivation.

2. Methods

Setting: Health workforce in Malawi. Malawi relies on a predominantly public, three-tier health system which provides essential

healthcare services free of charge at point of service. Service utilization is high (NSO, 2016), but quality often poor for various reasons including a severe health worker shortage leading to high workload levels particularly for mid-level cadres who provide the vast majority of essential services, frequent but unsupportive and low-quality management and supervision, and frequent stock-outs of drugs and supplies (Bradley et al., 2015; Manafa et al., 2009; MoH, 2014). Beyond these aspects, previous research has found health workers dissatisfied and frustrated with low income levels; delays in salary payments; lack of transparency and perceived unfairness of salary top-ups and per diems; seniority-rather than merit-based progression on salary scales; limited training and career opportunities; and a general lack of recognition of their efforts by managers and other health system actors (Chimwaza et al., 2014; Manafa et al., 2009). Despite often dissatisfying and demotivating work environments, Malawian health workers expressed high levels of pride and feelings of achievement and importance in relation to their job in previous research (Goldberg and Ron Levey, 2012). Health workers in rural areas in particular stated to be motivated because of the opportunity to serve communities in need, by a sense of patriotic duty, and by the opportunity to learn and grow on the job (Manafa et al., 2009).

The RBF4MNH Initiative. RBF4MNH was introduced in April 2013 by the Malawian Ministry of Health (MoH) with financial support by the governments of Norway and Germany and technical support by Options Consulting, initially in 14 primary- and 4 secondary-level health facilities in the Balaka, Dedza, Ntcheu, and Mchinji districts (Phase I), and extended to 10 additional facilities in 2014 (Phase II). RBF4MNH combines PBF with conditional cash transfers (CCT) to pregnant women to increase the quantity and quality of delivery services. The PBF component includes performance contracts targeting health facilities and District Health Management Teams (DHMT). Health facilities were selected into the intervention in a non-random way based on their ability to serve as emergency obstetric care centers. In most selected facilities, this necessitated substantial unconditional start-up support in the form of infrastructure upgrades, provision of essential equipment, refresher trainings, and additional staff postings. Health facilities are rewarded for the attainment of performance targets which reinforce adherence to treatment standards for maternal care (e.g. correct use of partographs, HIV testing in pregnancy). All rewards are monetary; maximum rewards are pre-set and discounted depending on target attainment levels. Performance verification was initially done half-yearly in a peer-to-peer arrangement. At the end of 2014, an external agency was contracted to verify every three months. Facilities are required to invest 30% of their performance rewards into the facility, and can distribute 70% to staff as bonus payments. They are autonomous in their decisions how to divide the staff portion between staff members and how to invest the facility portion. The latter is with the exception of drugs, which health facilities are not allowed to purchase but continue to request from the DHMTs. Individual bonus payments amounted to an average of about 34 USD in the first quarter of 2015, with large variations between facilities and cadres, which is equivalent to about 6% of health workers' basic salary (Lohmann et al., 2018).

Study design. This study took place in the context of a broader impact evaluation of the RBF4MNH Initiative (Brenner et al., 2014). We used a prospective mixed-methods design, with the quantitative component serving to estimate the impact of RBF4MNH on autonomous motivation, and the qualitative component serving to shed light on how RBF4MNH did or did not bring about such change in autonomous motivation.

All 18 intervention facilities included in Phase I of RBF4MNH were included in the impact evaluation. As comparison facilities, 15 facilities in the four districts were selected which did not receive the intervention initially, but were to receive it after completion of the impact evaluation. However, due to early availability of additional funding, scale-up was advanced to shortly after the midterm data collection and included 5 of the original comparison facilities. At endline, the facility sample

therefore included 23 intervention facilities (5 secondary-level and 18 primary-level), 5 of which had received RBF4MNH only for the latter half of the two-year impact evaluation period, and 10 comparison facilities (all primary-level).

Ethical approval was granted by the ethical commissions of Heidelberg University's medical faculty (protocol S-256/2012) and the University of Malawi's College of Medicine (protocol P.02/13/1338).

2.1. Quantitative study component

The quantitative study component relied on a controlled pre- and post-test design. Data was collected with a structured health worker survey just before (March/April 2013; baseline) and approximately two years (June/July 2015; endline) after the start of the intervention.

Sample. Within the 33 facilities, health workers providing maternal health care services (i.e. clinical officers, medical assistants, registered/enrolled nurse/midwives, nurse-midwife-technicians) who had worked at the health facility for at least one year were eligible for participation in the survey to allow for sufficient exposure to PBF and/or the current work environment. At primary level, all eligible staff available during the stay of our interviewer teams were interviewed; at secondary-level, at least five health workers from the maternity department were sampled. Table 1 contains demographic characteristics of the resulting sample. Differences were not statistically significant, except for level of care due to all secondary-level facilities being part of the intervention group.

Autonomous motivation measure. Autonomous motivation was measured with six items from the SDT-based Work Extrinsic and Intrinsic Motivation Scale (WEIMS; Tremblay et al., 2009). The WEIMS follows the measurement rationale that individuals reveal their locus of causality for behavior in the reasons for their actions they provide. Following the guiding question "Why do you do your work?" (WEIMS), a list of potential reason for why people are engaged in their job is provided. Reasons pertaining to autonomous motivation include for instance "I work in this job for the satisfaction I experience from taking on interesting challenges" or "I work in this job because my work has become a fundamental part of who I am". Respondents are asked to indicate their degree of agreement on a scale from 1 to 5.

A Confirmatory Factor Analysis (CFA) confirmed that the six items measured autonomous motivation well ($\chi^2(9) = 9.748$, $p = .371$; RMSEA = 0.024; CFI = 0.990; SRMR = 0.044; item-factor loadings were of similar magnitude). Cronbach's α (i.e. average inter-item correlation) was .72 overall and consistent across data collection time points and study groups, supporting the CFA results. Tests for measurement invariance showed equal measurement properties of the items in the intervention and comparison subsamples, confirming that autonomous motivation scores can be compared across study groups (Borghi et al., 2018).

Data collection procedure. Data was collected by trained research assistants using tablet computers. Interviewer teams spent 3 days at each health facility at baseline, and 5 days at endline. The survey was administered in English as a face-to-face interview. All data collection activities started with an extensive explanation of the data collection purpose and reassurance on confidentiality concerns, seeking respondents' written informed consent.

Data analysis. For each respondent, we combined the autonomous motivation items into a composite score by calculating the unweighted mean of responses to the six items.

We used a Difference-in-Differences (DID) approach to estimate the impact of RBF4MNH on autonomous motivation. The linear regression model was specified as

$$Y_{fit} = \beta_0 + \beta_1 \cdot EL_t + \beta_2 \cdot [PBF_f \cdot EL_t] + \theta_f + \beta' \cdot X_{it} + \varepsilon_{fit}$$

where Y_{fit} is the level of autonomous motivation for individual i from facility f at time t with $t = \{\text{baseline endline}\}$; EL_t is a dummy variables indicating endline observations; PBF_f is a dummy variable indicating

Table 1
Sample characteristics.

	Quantitative sample								Qualitative sample	
	Intervention				Comparison				Intervention	
	Baseline		Endline		Baseline		Endline		Midterm	Endline
	n	%	n	%	n	%	n	%	n	n
Total	60		51		10		20		21	20
Sex										
Female	41	68	29	57	6	60	10	50	11	11
Male	19	32	22	43	4	40	10	50	10	9
Health worker type										
Clinical officer, medical assistant	7	12	12	24	1	10	5	25	5	2
Nurse/midwife	53	88	39	76	9	90	15	75	16	18
Level of care										
Primary	27	45	29	57	10	100	20	100	10	11
Secondary	33	55	22	43	0	0	0	0	11	9
	mean	sd	mean	sd	mean	sd	mean	sd	median	median
Years at facility	5.3	6.0	6.1	6.9	4.2	3.9	3.3	1.9	3.0	3.5
Years in service	12.3	12.7	10.0	11.5	17.2	10.3	14.3	15.5	–	–

individuals from intervention facilities (phase I and II); and X_{it} is ε_{fit} the error term. In the absence of a panel at health worker level, we used facility fixed effects (θ_f) to control for unobserved and potentially motivation-relevant time-invariant facility characteristics, and further controlled for a number of individual characteristics (sex, cadre, years at current facility, years in health care service; X_{it}). We clustered standard errors at the facility level (i.e. level of intervention assignment). Coefficient β_2 gives the DID estimate for the effect of PBF on autonomous motivation. As all secondary-level facilities were part of the intervention, we performed the DID regressions both on the overall sample and on a subsample of only primary-level facility staff.

2.2. Qualitative study component

The qualitative study component consisted of in-depth interviews with nurse/midwives, medical assistants, and clinical officers from intervention facilities approximately one (April 2014, midterm) and two years (September 2015, endline) after the start of the intervention. We purposely selected 12 and 14 facilities at midterm and endline, respectively, to represent the four districts, both levels of care, different facility sizes, and varying performance levels in the intervention. At each facility, we then purposely selected between 1 and 4 health workers, depending on facility size and staff availability and to represent both sexes and all seniority levels. Only health workers who had worked at the facility for at least one year were sampled to ensure sufficient exposure to RBF4MNH. In total, 21 and 20 health workers were interviewed at midterm and endline, respectively. Table 1 shows key characteristics of the sample.

Data collection, management, and analysis procedures for the qualitative component are described in Lohmann et al. (2018). This article relies on the same material and general analytical procedures, including analyst triangulation, but applied a different, SDT-based analytical lens and framework, examining how the various positive and negative motivational mechanisms of RBF4MNH impacted health workers' basic psychological needs for autonomy, competence, and relatedness, and thereby autonomous motivation.

2.3. Triangulation of quantitative and qualitative findings

Quantitative and qualitative data were collected and analyzed independently. Triangulation occurred at the interpretative level, with the final appraisal on the impact of RBF4MNH on autonomous motivation relying jointly on the quantitative and qualitative findings. Quantitative findings allowed a quantification of the impact of

RBF4MNH on autonomous motivation. Qualitative findings were used to elucidate these quantitative findings.

3. Results

3.1. Quantitative results

Table 2 shows summary statistics as well as the model-estimated DID estimate for the impact of RBF4MNH on autonomous motivation, for the overall sample as well as the primary-level subsample. Health workers consistently indicated high levels of autonomous motivation at baseline, which remained stable over time. No impact of RBF4MNH on autonomous motivation could be detected.

3.2. Qualitative results

The qualitative findings offer possible explanations as to why no RBF4MH impact on autonomous motivation was apparent. Specifically, results suggest that the intervention did not simply leave health workers' autonomous motivation unaffected. Rather, it appears that the intervention both positively and negatively affected the satisfaction of health workers' basic psychological needs. In the following, we describe the most commonly mentioned effects. Important to note is that while all respondents experienced both positive and negative impact on their basic needs satisfaction, there was substantial individual variation in which effects were mentioned and in the extent to which positive or negative effects appeared to predominate.

3.2.1. Need for competence

Our analysis suggests that RBF4MNH contributed in mostly positive ways to the satisfaction of health workers' need for competence – an

Table 2
Impact of RBF4MNH on health workers' autonomous motivation (1 = high level; 5 = low level).

	Intervention				Comparison				Difference-in-differences	
	Baseline		Endline		Baseline		Endline		DID	p
	mean	sd	mean	sd	mean	sd	mean	sd		
Full sample	2.01	.50	1.95	.49	1.85	.51	1.71	.43	-.035	.833
Primary care subsample	1.95	.42	1.91	.52	1.85	.51	1.71	.43	.022	.910

inherent desire to do well in the various dimensions of one's job and to have an impact on one's work environment and outcomes –, although many respondents also alluded to a few negative aspects attenuating this overall positive impact.

Our findings indicate that RBF4MNH enhanced satisfaction of the need for competence by improving health workers' perceived ability to do their job. Many health workers expressed their appreciation for how RBF4MNH helped them develop their clinical skills and feel more confident at work through training measures and better on-the-job training as a result of the intervention. Almost all reported how the improved infrastructure, equipment, and resource situation resulting from RBF4MNH made them feel more effective in translating their skills into practice. Many health workers further described how they felt that their work teams had improved service delivery routines, working together more efficiently, as a consequence of RBF4MNH.

Our results further suggest that RBF4MNH contributed to satisfying the need for competence by reminding health workers of the standards of care they had promised to deliver when joining the profession and helping them better understand performance expectations towards them. Health workers reported how the continuous performance feedback through enhanced supportive supervision and verification in the context of RBF4MNH provided new opportunities to critically evaluate their performance against these standards. Many described how by stimulating critical reflection on performance shortfalls, by guiding them in proactively developing strategies for improvement, and by enabling them to implement such solutions at least to some extent, the intervention helped them feel more effective in their work.

The majority of respondents perceived that the quality of their work had improved as a result of RBF4MNH, some even improvements in patient outcomes, instilling in them a new sense of competence and pride in their accomplishments at work.

I just have the morale because I know what I am doing and with RBF4MNH, the fact that we have almost everything now. [...] It was very different. Before, we were like 'Aah, what am I going to do with the patient?' [...] But now we can treat them and you know the patients are getting well, you know 'Aah, I've managed the sepsis and she is ok, she is going home.' You feel good. (Nurse/midwife, endline)

Although the vast majority of respondents perceived primarily positive effects of RBF4MNH on feelings of competence, many also reported aspects which weighed in negatively. Many health workers explained that RBF4MNH opened their eyes to their substandard level of performance and their non-enabling and non-supportive working environment. While almost all respondents seemed to appreciate this 'wake-up call', it was not necessarily conducive to the satisfaction of the need for competence. The continued substandard working conditions keeping them from delivering truly high quality care – a situation which with RBF4MNH many saw with new clarity – negatively weighed on health workers' feelings of self-efficacy. Particularly in the second year of the intervention, interviews revealed a growing frustration with the fact that RBF4MNH had increased workload and resource consumption, which were not met adequately with increases in staff and resources in many facilities.

The vast majority of respondents seemed to be effective in externalizing their continued shortfalls from ideal performance standards, attributing it to the mismatch between performance standards and working conditions rather than to own incompetence, and thereby containing negative impact on the satisfaction of the need for competence. Many also indicated that they were effective in focusing their attention on the improvements they did manage to achieve, rather than on shortfalls from the absolute performance ideals reflected in the RBF4MNH targets, thereby attenuating negative impact on basic need satisfaction.

I think most of [RBF4MNH] is helpful, and if we had all resources

that are required, human resources, material, equipment, we would really improve the mortality and morbidity rates among the mothers and the newborn babies. (Nurse/midwife, endline)

However, a few respondents seemed less successful in 'blaming the context' and focusing on improvement rather than absolute achievement.

I am proud being a nurse. In the morning, I go to the hospital to take care of the patients. At the end of the day I did nothing. So I feel as a failure. (Nurse/midwife, endline)

3.2.2. Need for autonomy

Our analysis indicates that RBF4MNH both positively and negatively contributed to health workers' satisfaction of the need for autonomy – the desire to be able to shape one's experiences and behavior according to one's own goals and values, to believe in and endorse what one does at work, and to be able to, within professional borders, to decide and do as one thinks best.

In positive terms, RBF4MNH appeared to support satisfaction of the basic need for autonomy in that virtually all health workers expressed strong endorsement of the overall intervention goals and feelings of ownership of the program. Even though very few respondents had been consulted in the intervention design stage, respondents also expressed strong endorsement of the indicator set, particularly its good alignment with existing standards of care they had committed themselves to when joining their profession.

We feel good about being [part of RBF4MNH]. When the patients come in large numbers, we feel okay. This brings a lot of workload, but we are happy when they are here and we know that we are improving the livelihood of women and children, and on top of that, we will be rewarded. (Medical assistant, midterm)

About half of the sample revealed how RBF4MNH helped them be more purposeful and effective in their work by stimulating awareness for and the development of locally tailored solutions to diverse challenges. Health workers described how the financial rewards further allowed facilities to implement at least some of these solutions in fast, non-bureaucratic, and effective ways, in stark contrast to what they were used to previously. By thereby not only passively improving working conditions and service delivery routines in a top-down, one-fits-all approach, but by rather allowing facilities to actively bring about desired positive change themselves through the PBF reward payments, it appears that RBF4MNH further positively contributed to the satisfaction of many health workers' need for autonomy.

[RBF4MNH] is good because it gives us power at the health center level to decide what's good for us and what's lacking for us instead of relying on the district level for everything. (Nurse/midwife, midterm)

At the same time, almost all respondents made clear that the decentralization of financial management autonomy did not go far enough, with solutions to many problems such as the availability of staff and drugs remaining beyond their control. They described this as frustrating, particularly having experienced the advantages of procurement autonomy. In light of this, perceptions about the targets attached to the indicators were much more mixed than perceptions about the indicators themselves. Although respondents were in general agreement that high performance standards should be attained, many did not feel like this was currently possible given the contextual constraints and the high workload they were faced with, at least for certain indicators. RBF4MNH thereby put at least some health workers in a position where they perceived their freedom or scope of action as even further restricted, asking them to pursue targets that they did not feel they could attain, at least not without compromising other aspects of their work or their personal wellbeing. At the same time, the high

stakes (i.e. reputational aspects, reward payments; individual ‘opting out’ difficult given implementation at team level) associated with performing well in the intervention appeared put pressure on at least some health workers. A few respondents reported that they had witnessed colleagues coping with this situation in undesired ways, such as by forging register entries, although nobody admitted to having done so themselves.

The picture that people have outside [is] that we are not doing anything, yet to us, it's not deliberate, it's just that the situation is not allowing us. It's hard. We can't do what we are required to do, but there is nothing I can do about it. I still come to work normally, but deep down, I feel things are not working. (Nurse/midwife, endline)

3.2.3. Need for relatedness

In regards to the satisfaction of health workers' need for relatedness – the desire for positive relationships and interactions with, for feeling fairly treated, respected, and valued by, for feeling recognized by, and for feeling cared for and supported by clients, community, colleagues, direct superiors, and the broader health system – our results suggest that RBF4MNH also had both positive and negative effects, but negative effects seemed more pronounced for the majority of respondents.

On the positive side, RBF4MNH appears to have led to more attention being paid to health workers by their managers, the broader health system, and also clients. This is substantiated by about a third of the respondents describing how with RBF4MNH, they felt more visible and appreciated. They also perceived a growing recognition of their difficult working conditions, and respect for their effort and performance despite these difficult working conditions. They experienced this as generally positive compared to the pre-RBF4MNH situation, where many felt that nobody cared about them and their circumstances except in cases of serious underperformance. Respondents expressed high appreciation of the material and immaterial support by RBF4MNH and the small improvements in DHMT support experienced by some facilities, which alleviated some of their hardships at work and in their private lives.

We feel good because [the DHMT now] comes and recommends us that we are doing a very good job. Like the water system, we actually decided ourselves to do it [with RBF4MNH money]. They appreciate that that's very good. And the toilet too, we told them that we are building this. They said, you are doing a very good job. They really appreciate us and recognize the role we are playing. (Medical assistant, endline)

Respondents further described how RBF4MNH stimulated improvements in team work in many facilities as staff members worked towards the common goal of achieving RBF4MNH targets. In many facilities, this resolved previous frustrations and interpersonal conflict in service delivery routines, thereby contributing to the satisfaction of the need for relatedness.

On the other hand, respondents also revealed that RBF4MNH led to substantial interpersonal challenges by allowing health facilities to freely decide over how to share money among staff members. The ensuing tension and fighting was a source of frustration for almost all respondents, particularly in the first year of implementation, negatively impacting the satisfaction of their need for relatedness. Some health workers ended up receiving very small absolute incentive amounts. They described how against the expectation that they should feel motivated by these small amounts, the incentives offended them rather than making them feel recognized and respected. Compromises in sharing incentives led to many health workers feeling undervalued, as they did not think their share of the rewards fair in relation to the effort they had contributed to their facility's performance.

I think the [RBF4MNH secretariat] should decide [who gets how

much], because this money is creating a lot of enmity. [...] Wherever there is money, people always disagree. (Nurse/midwife, midterm)

Most health workers further perceived other elements and dynamics of the intervention as unfair, weighing negatively of the satisfaction of their need for relatedness. Particularly in the first year of implementation where the peer-to-peer verification model was applied, many health workers felt that evaluators were unfair in their evaluations, leading to results which they felt did not reflect their true performance, and to reward amounts below what they felt was appropriate. Several respondents further complained that the DHMTs and the RBF4MNH secretariat did not adequately reciprocate their own effort in making the project a success. Finally, particularly at endline, as contextual challenges became more pronounced, several health workers voiced that they felt disrespected by an intervention benefitting women without regard for health workers' already challenging working conditions and at the expense of their health and wellbeing.

4. Discussion

Our Self-Determination Theory-based study investigated whether and how the Results-based Financing for Maternal and Newborn Health Initiative in Malawi affected health workers' intrinsic motivation. We thereby contributed to closing an important gap in knowledge regarding one of the most frequently discussed potential unfavorable consequences of PBF, namely an erosion of high-quality, sustainable motivation, “intrinsic motivation crowding out”.

Results suggest that overall, RBF4MNH did not impact health workers' intrinsic motivation. This finding is somewhat different from the findings of the three previous studies on the impact of PBF on intrinsic motivation, all of which conclude that some crowding out of intrinsic motivation appears to have occurred (Aninanya et al., 2016; Dale, 2014; Huillery and Seban, 2014). As neither of the previous studies systematically examined how PBF effected changes in intrinsic motivation, reasons for the differences between our and their results remain unclear.

In Malawi, the qualitative findings support the hypothesis that PBF does not have a generally adverse effect on intrinsic motivation as feared by some, but that it rather has the potential of both crowding in and crowding out intrinsic motivation, depending on the specific intervention design, implementation, and results, and health workers' experiences thereof (Lohmann et al., 2016). Specifically, our findings suggest that the different motivational mechanisms triggered by RBF4MNH both positively and negatively affected health workers' basic psychological needs satisfaction. We found substantial individual variation in the extent to which respondents perceived positive and negative effects. For most respondents, however, positive and negative effects appeared to have counteracted each other to some extent, offering at least a partial explanation for the overall null impact of RBF4MNH on intrinsic motivation. Although our study did not set out to disentangle the effects of the individual rewards – to which fears of crowding out primarily relate – from all other intervention elements, it does appear that the individual rewards were primarily associated with negative effects on basic needs satisfaction. In summary, RBF4MNH appeared conducive to intrinsic motivation in many ways, but it also clearly fell short of its intrinsic motivation-enhancing potential due to various challenges.

These challenges will not come as a surprise to the PBF implementing and academic community, as many of them are well-known from other settings (e.g. Sierra Leone, Bertone et al., 2016; Nigeria, Bhatnagar and George, 2016; Tanzania, Chimhutu et al., 2016; Benin, Paul et al., 2014; Burkina Faso, Ridde et al., 2018; Zambia, Shen et al., 2017), and neither will the straightforward recommendations implied by our research to avoid or contain negative impact on intrinsic motivation, such as: to maximize transparency in the verification and

reward allocation process as well as in the reward use and distribution process; to adhere to planning, timing, and made agreements, and communicate effectively in case of delays or changes; and to set achievable PBF targets or employ a fee-for-measure logic.

At the same time, many intrinsic motivation-relevant challenges encountered in Malawi and elsewhere might be beyond what can realistically be counteracted by clever PBF design and implementation. For instance, it seems that dissatisfaction with and feelings of unfairness regarding the individual rewards are not necessarily directly related to the actual reward amounts and distribution modes. In Malawi, neither the increase in overall reward amounts in the second year, nor various distribution modes negotiated locally (e.g. equal shares for all, higher shares for higher qualified staff) appeared to make much of a difference in terms of satisfaction and fairness perceptions. Many respondents expressed a wish for RBF4MNH to prescribe a reward distribution mode. Although in some countries with such fixed modes, complaints appear less pronounced (e.g. Bertone et al., 2016, in Sierra Leone; Paul et al., 2014, in Benin), reasons might lie elsewhere, and serious injustice perceptions around incentive distributions have been encountered in fixed-mode countries as well (e.g. Ridde et al., 2018, in Burkina Faso). In Tanzania, the distribution mode based on health workers' level of involvement in the intervention was also perceived as unjust by many health workers (Chimhutu et al., 2016). Other issues difficult to counteract with PBF design and implementation include for instance resource challenges related to the broader health system and the setting of PBF targets attainable yet aligned with national performance standards which often are overly ambitious given contextual constraints.

In light of this, designing a PBF intervention fully free of intrinsic motivation-compromising challenges is likely a futile endeavor. Rather, PBF designers might want to pay more attention to 'secondary prevention' of inadvertent negative impact on intrinsic motivation. One concept much discussed and researched in the SDT and organizational change literature is that of "autonomy support" (e.g. Gilbert and Kelloway, 2014). It refers to leader behavior which supports employees in behavior change processes so that the satisfaction of the basic psychological needs is supported rather than thwarted, and so that employees are able to internalize and therefore perceive new behavior as self-determined rather than controlled. Three general principals of how managers can support employees' autonomy are to provide rationale for behavior change, helping employees understand why decisions were taken and change is necessary; to offer employees maximal choice in how to go about implementing change and reorganizing their work processes, within technical limits; and to acknowledge employees' feelings about the change process and supporting them in coping with these feelings. Offering maximal autonomy in implementing change along with technical and managerial support as well as activities to help health workers understand the meaningfulness, benefits, and costs of PBF are already part of good PBF design practice (Fritsche et al., 2014). In contrast, specific training for health facility, district, and PBF management staff in how to support health workers in cognitively and emotionally processing and coping with the introduction of PBF to preclude or resolve diverse intrinsic motivation-adverse frustrations is usually not part of standard PBF intervention packages. Such systematic autonomy support training for managers in the context of PBF might be valuable in maximizing positive motivational impact of PBF for health workers.

Unfortunately, our study did not allow to explore potentially important heterogeneity in PBF impact on autonomous motivation, or to quantify and detect individual variation in how the different elements of RBF4MNH contributed to changes in basic needs satisfaction, how basic needs satisfaction in turn impacted autonomous motivation, and which other variables might have played a relevant role. Further, the period of observation was limited to only two years, which might be too short for fundamental changes in motivational structures to occur. Finally, we cannot fully exclude the possibility that PBF differentially affected turnover of staff with different levels of intrinsic motivation,

and that baseline and endline samples are therefore not perfectly comparable. However, an additional analysis limiting the quantitative endline sample to only those health workers who had worked at their endline facility at baseline already supported the robustness of the quantitative findings. Future research with a panel design and closer alignment of the quantitative and qualitative study components allowing such linkages will be very valuable for an even more in-depth understanding of the motivational impact of PBF, as well as of potential risk and mitigating factors.

5. Conclusion

We found no effect of RBF4MNH in Malawi on health workers' intrinsic motivation; neither crowding in nor crowding out of intrinsic motivation could be observed overall. Health workers described experiencing various positive and negative intervention effects on the satisfaction of their basic psychological needs, which appeared to counteract each other at least partly. To achieve crowding in of intrinsic motivation, PBF designers and implementers should contain avoidable intrinsic motivation-compromising challenges and mitigate unintended negative impact of unavoidable challenges by explicitly building strategies such as autonomy support activities into PBF designs.

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